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ELECTRIC RAILWAY TRACTION

A Supplement illustrating and describing developments in Electric Railway Traction is presented with each copy of this week's issue.

Leek versus Thistle To assist Welshmen arriving at Edinburgh to see the Scotland versus Wales International Rugby match played at Murrayfield last Saturday, the L.M.S. transported some of its staff from the Swansea district to the barriers at Princes Street station. It was thought that the knowledge these men had of the geography and language of Wales would enable them to help and guide their countrymen who had made the journey as partisans of their country's football team. It is not clear which the L.M.S. doubted, the ability of the Welsh to understand the Scots or the Scots the Welsh, but the main point was that 31 special trains from Wales were going to disgorge their loads of enthusiastic Welshmen into the midst of the Scottish capital, incomprehensibles among the incomprehensibles. Strange that some 300 miles or so of crowflight should end in a lingual difficulty to the British, who somehow or other manage to make themselves understood in the uttermost parts of the world. As the Welsh team beat the Scottish by two goals and a try to a penalty goal and a try it is perhaps as well that the departing Welshmen could not understand the language of the Scots.

Thomas Telford Thomas Telford, the centenary, of whose death will be commemorated on September 2 this year, lived a little too soon to become greatly preoccupied with railway construction, but he was a keen early advocate of the use of railways and indirectly his influence on early railway engineers must have been an important one, for it was he who proved the desirability of providing roads with solidly-laid foundations. Telford is said to have considered the London-Holyhead road to be his greatest work, and it is generally agreed that his suspension bridge over the Menai Straits constitutes the most impressive monument to his genius. Built in 1826 and having a span of 580 ft., this bridge represents one of the boldest of the early applications of wrought iron. An interesting plan of Telford's to replace London Bridge by a single 600-ft. iron span rising 65 ft. above the Thames was seriously considered in 1801, but it was ultimately abandoned on account of the expense of the necessarily long inclined approaches. Nevertheless, several iron arch bridges of less imposing dimensions were built elsewhere to Telford's designs. Born in 1757 to a Dumfries shepherd who died in the same year, Telford was himself a shepherd in his early years. His genius for engineering was developed with the help of borrowed books, and his ultimate success was in no small measure due to the influence of John Pasley, a wealthy London merchant.

The Week's Traffics Merchandise traffics of the four group companies for the past week again show substantial advances, but the passenger increases are moderate except on the L.M.S., and coal traffics are on the whole lower for the week. For the year to date the receipts of the four companies together show an increase of £874,000 or 7·22 per cent. Merchandise traffics for the five weeks are higher by £692,500 or 16·84 per cent., passenger train traffics have improved to the extent of £88,000 or 1·85 per cent., and coal class receipts by £93,500 or 2·89 per cent. The increases in merchandise receipts for three of the four companies for the five weeks are:—L.N.E.R. £263,000 or 20·51 per cent., G.W.R. £116,000 or 15·84 per cent., and L.M.S.R. £288,000 or 15·66 per cent.

	5th Week				Year to date	Inc. or dec. %
	Pass. &c.	Goods, &c.	Coal, &c.	Total.		
	£	£	£	£	£	
G.W.R.	+ 1,000	+ 28,000	− 3,000	+ 26,000	+ 116,000	+ 5·65
L.M.S.R.	+ 17,000	+ 57,000	− 27,000	+ 47,000	+ 348,000	+ 7·10
L.N.E.R.	+ 6,000	+ 51,000	+ 4,000	+ 61,000	+ 351,000	+ 9·80
S.R.	+ 6,000	+ 10,000	+ 1,000	+ 17,000	+ 59,000	+ 3·79

On the Great Northern Railway (Ireland) there is a traffic increase of £8,400 for the week ended February 2, but in 1933 there was the strike which began on February 1.

L.M.S. Dividend The L.M.S.R. dividend announcement made on Wednesday afternoon was satisfactory and had a good reception. On the 4 per cent. preference stock there is to be a final dividend of 2½ per cent. making 3½ per cent. for the year, and on the 5 per cent. redeemable preference stock (1955) which ranks *pari passu* with it the final dividend will be 3⅛ per cent. making 4⅜ per cent. for the year. For the whole year 1932 the 4 per cent. stock received 3 per cent. and the 5 per cent. stock 3¾ per cent. and the proposed distribution on the two stocks for the year 1933 represents a payment of £4,586,144, which is £655,164 more than they received for 1932. Net revenue for 1933 is given as £10,713,000, comparing with £9,904,823 for 1932, and a sum of £59,654 will be carried forward, a fact worth noticing as this is the first time since 1929 that a balance has been carried forward. As was generally expected there is to be no dividend on the £40,133,987 of 4 per cent. preference stock (1923) nor on the £95,202,441 of ordinary stock, neither of which received any dividend for 1932. Railway receipts for 1933 decreased by £322,000 and receipts from all sources by £326,000, but reductions in working expenses amounted to £1,134,000, giving a net increase of £808,000.

The U.S.A. Transport Co-ordinator Mr. Joseph B. Eastman, the Federal Co-ordinator of Transportation under the Emergency Transportation Act of 1933, submitted to Congress on January 20 the first of three reports he is to make. Mr. Eastman favours ultimate State ownership and operation of the American railways, although he considers that the time is not ripe for putting such a scheme into operation. Mr. Eastman's immediate recommendations include certain compulsory minor amalgamations, although he rejects the idea of "grand consolidations," the acceleration of specific reforms, relief from legislation unhelpful to the railways at the present time, and generally freeing the railway administrations of hampering conditions, particularly with regard to reduction of staff. These reforms could be put into force without new legislation. The continuation of the co-ordinator plan for another year is, of course, recommended. The other two reports, which are expected shortly, will deal with the regulation of other means of transport, possible improvements in the system of railway regulation, and railway labour legislation. By means of these reports, President Roosevelt, aided by the Interstate Commerce Commission and a special advisory committee on transportation, hopes to draw up a scheme for a national transportation system which will give to every form of transport its proper economic sphere. The gentleman's way to socialism?

Donegal Developments A commission has recently been set up by the Minister for Industry and Commerce of the Irish Free State to advise on industrial, commercial, and transport questions affecting that country, and one of the first matters brought under review has been the proposal to establish a deep-water port for Donegal. Killybegs, on the north side of Donegal Bay, with its well-sheltered harbour—which served as a submarine base during the war—is the site selected, and it is desired to make the port suitable for use by large ocean-going vessels. From the Free State point of view it is unfortunate that communication by rail between Killybegs and other parts of Donegal involves crossing the frontier into and out of Northern Ireland, via Strabane, with two Customs examinations in consequence. Bound up with this Killybegs project, therefore, is another proposal, to link up the County Donegal Joint Committee's Killybegs and Strabane main line at Killygordon (9½ miles from Strabane), with Convoy, 9 miles from Strabane on the same committee's Strabane and Letterkenny line, which would open up through rail communication between Killybegs and Letterkenny, and from the latter town over the lines of the Londonderry & Lough Swilly Railway (including the Letterkenny & Burtonport extension), entirely within Irish Free State territory. The new link between Killygordon and Convoy would be about 6 miles in length through easy country from the engineering standpoint.

Economic Train Speeds in India In a recent issue of the Great Indian Peninsula Railway staff magazine the deductions to be drawn from dynamometer car tests were discussed. After stating that the dynamometer car is the most valuable instrument from which to obtain data for the basis of future locomotive design, it is recorded that trials on the G.I.P. indicated the economical speed of operation by a freight train to be about 43 m.p.h. as a fair average. This means, first, that most of the company's freight locomotives now in use are unsuitable, as they cannot maintain that speed, and double-heading with passenger locomotives might prove too expensive, owing to the heavy cost of wages of the extra crew and other items. What is indicated is that in future the design and operation of passenger and freight locomotives will have to be carried out with the "economic speed of operation" as a fundamental basis. The effect of speeding up freight traffic would certainly prove an advantage, as at present freight trains, owing to their slow speeds, take a long time to pass over a block section and hence are very liable to cause delays to traffic. If, however, the goods trains were operated at speeds of between 40 to 50 m.p.h., then, apart from the question of economy of power, operating conditions would be improved, since a freight train, doing a steady 40/45 m.p.h. and stopping only at large watering and transhipping stations, would cover the same distance in the day as the faster passenger trains running at 48/60 m.p.h. and stopping at more stations. To fulfil requirements such as these, powerful mixed traffic locomotives would probably be the most economical. The tests we recorded recently in these pages of the combined hauling power and high speed capacities of the Garratt articulated type come to mind in this connection.

The "6.20" Club An Irish correspondent has written from Bangor, County Down, claiming for certain Bangorians who travel to their work in Belfast each day the distinction of having formed the only train-travel club in Ireland. Everything connected with the Club, known as the "6.20," is novel, and its headquarters are coaches specially provided by the Belfast & County Down Railway between Bangor and Belfast on the 8.35 train each morning, and the 6.20 each evening. The first principles of the Club are goodwill and fellowship, and its members, who meet on the same level, include merchants, clerks, schoolmasters, in fact men of all trades and professions. The Club's activities are similar to those of a debating society. Each journey forms a complete session, but discussions often last several days. The topics under discussion range from the stars in the heavens to the inhabitants of the ocean's bed, and, of course, politics, church, municipal and social affairs all receive attention. Members, who pay a nominal subscription which is devoted to charities, elect a new chairman to preside over the discussions each month. Much of the success of the "6.20" Club is due to the valuable assistance given by Mr. W. F. Minnis, General Manager of the Belfast & County Down Railway.

Detecting Rail Defects The urgency of the rail defect problem in many countries—Great Britain fortunately excepted—has directed much research towards the perfection of appliances for the detection *in situ* of defects in rails. The importance of carrying out the work on the track, rather than at the works at which the rails are made, lies in the fact that such defects as the transverse fissure may develop under traffic to a dangerous size from a minute nucleus which would not be capable of detection when the rail was new. The Sperry method of detecting defects, which has so extensive a vogue on the North American Continent, and is now coming into use also in France, is based on the changes in electrical resistance caused by the presence of fissures when the rails are charged with an electric current, and the apparatus required calls for the provision of a vehicle equal in size to an ordinary railway coach. In Japan, however, there has now been perfected, by three officials of the Japanese Government Railways, a magnetic rail inspection car, which utilises for defect detection the leakage of magnetic flux in the rail. This car, which can be arranged for motor or hand propulsion, is little larger and heavier than an ordinary inspection trolley, but gives a graphic representation on a paper roll of all the defects

located, as well as marking the positions of the defects on the rails themselves, with much the same accuracy as the larger vehicle.

Accidents to Railway Servants The Ministry of Transport Railway Accidents blue book for the three months ended June, 1933, contains 41 reports by the assistant inspecting officers on the more serious accidents to railway servants. These 41 reports were divided among the companies as follow, the number of fatal accidents being added in brackets: G.W.R., 6 (1); L.N.E.R., 13 (2); L.N.E.R. and L.M.S.R. Joint, 1; L.M.S.R., 8 (4); Mid. and G.N. Joint, 1 (1); S.R., 12 (5). Five of the men killed were employed on the permanent way; four were firemen; three were one each from the grades of wagon fitter, foreman and dock labourer and one was a contractor's servant. The cause assigned in five cases was misadventure; five, want of care by the man himself; one, want of care on the part of others; one, a man forgot his own safety; and another had a momentary lapse. The only exceptional feature that we see in the accidents of the quarter under review is the unusual number of firemen that were killed.

Additional Safeguards at Remotely-Controlled Points Every month brings news of further extensions of the use of remote control schemes for the operation of points and signals on the railways of the United States, where they have proved one of the greatest boons to the operating department, enabling not only a higher degree of safety to be obtained but a much better use of intermediate sidings and junctions. At such places it was, from the nature of the country, often inconvenient, if not almost impossible, to employ signalmen to work points and signals far away from any town or station. In any case they might be on duty for hours at a time and have little to do, which was not an economical method of working. Remote control, which becomes part of centralised traffic control when the despatcher himself works the signals and points, has changed the situation entirely. An installation of this kind on the Missouri Pacific Railroad, in which an important lap siding is controlled from a station over four miles away, has recently been described in *Railway Signalling*. The point operating apparatus exhibits one interesting feature in that the point tongues are fitted with an extra operating rod from the motor, which is attached to them 12 ft. from the end, so as to prevent any possibility of their being forced, or sprung home and locked with an obstruction caught somewhere between the tip and the heel. This rod has an additional point detection contact coupled to it, in series with that on the tongues themselves. The latter are 20 ft. long and the double connection is said to enable them to be moved more easily, as well as offering greater safety than the ordinary method hitherto used.

A Mobile Signalling School The London & North Eastern Railway, Southern Area, is to be congratulated on the novel signalling school which has just been opened. This, whilst fully equipped with model apparatus, is a mobile school, contained in an old sleeping car from which all partitions have been removed. The advantage of this arrangement over the usual signalling school, such as those at Manchester, York, and other places, is that the school is taken to the pupil and the time spent by the latter in travelling, and his expenses, are avoided. It must be remembered, too, that the Southern Area of the L.N.E.R. is very scattered and differs in that respect from the North Eastern Area, practically all of which is centred on York. A description of the equipment in the demonstration van and two illustrations of its interior were given in our issue of January 5 and we are now enabled to add thereto, on page 223 of this issue, a copy of the diagram of the track lay-out and of the signalling. This will be of additional interest in that a table of interlocking in each of the two model frames is given and details of the electrical controls. These may, we hope, give some of our readers a lesson in signalling! It may be added, as indicative of the thoroughness put in the model, that the demonstration table, which is 40 ft. long, carries 3,000 ft. of electrical wire.

New Metre-Gauge Locomotives for India We recently inspected at the works of W. G. Bagnall Limited, Stafford, some 2-8-0 type tender locomotives which had just been completed there for service on the metre-gauge Udaipur-Chitorgarh Railway, India. Built by a firm having a lengthy experience of overseas requirements where narrow gauge locomotive practice is concerned, these completely equipped engines are designed on well established, straightforward lines, and exhibit, both in their main essentials and in respect of detailed equipment, an excellence of workmanship that leaves nothing to be desired. They are substantially proportioned and present a robust and well set up appearance, as the illustrations reproduced on pages 214-215 of this issue show. The work to be performed in freight traffic is heavy. The ruling gradient of the line over which they will operate is 1 in 50, compensated for curvature, and the engines are designed to haul loads of about 300 tons on this section, to meet which requirement a tractive force of 21,980 lb. at 85 per cent. of the boiler pressure has been provided. The engines are being despatched at about the middle of the present month, and, after being disembarked at Bombay will, in their crated condition, have to traverse a distance of some 700 odd miles before reaching the territory in which they are to operate.

Railcars in the Cape A study of the last annual report of the South African Railways and Harbours reveals some interesting facts on the way in which the Administration views the operation of branch lines by railcars. Out of a total of 25 petrol cars operating on the 3 ft. 6 in. and 2 ft.-gauge lines, an average of 22 were constantly in service, and in covering an aggregate mileage of 485,149, they carried 170,695 passengers. But the General Manager, while recognising that the performance has been satisfactory in providing quicker and more convenient travel facilities, does not consider it desirable to proceed with the construction of any further vehicles of this class, all of which are 150 b.h.p. or less. Nothing further is to be done until actual working results are available of the two cars now under construction, one of which is powered by two petrol engines totalling 300 b.h.p., and the second by a similar arrangement aggregating 450 b.h.p. These railcars have been designed to enable a higher speed to be attained on steeply-graded sections, and to permit of the haulage of trailers. This would seem to be necessary, for the present rolling stock list includes only one trailer. Although a good deal of attention is given to diesel locomotives in the South African report, much of the data presented is out of date, and it does not appear therefrom that diesel railcars have been seriously considered, which is surprising in view of the success of this type of vehicle in sizes up to 400 b.h.p.

The Inner Circle Service

PROBABLY the best-known urban railway service in the world is the Inner Circle in London, which has, moreover, the unusual distinction of being maintained under statutory obligation. Section 90 of the London Transport Bill, which on Monday was given a second reading in the House of Commons, seeks to repeal the existing provisions as to continuous working of the Inner Circle and therefore it is of interest at the present time to recall the circumstances in which Parliament decided in its wisdom to pass obligatory provisions as to the maintenance of this railway service. Ordinarily such an arrangement would have been secured by the grant of permissive mutual running powers to the District and the Metropolitan Railways, without any specification as to the precise nature of the service use which would be made of them. As a complete circle the line has been in existence since October 6, 1884, when the final link, between Mansion House and Aldgate, was opened. The name Inner Circle was much older and had applied to the Mansion House - High Street, Kensington - Moorgate horseshoe service from its inauguration on July 3, 1871, when the Blackfriars-Mansion House line was opened and the District Railway assumed the operation of its own system. In the following year an Outer Circle, Broad Street - Willesden - Earls Court - Mansion House, was instituted by the L.N.W.R., and a Middle Circle, Moorgate-Bishop's Road - Addison Road - Mansion House, by the G.W.R.

As early as 1863 a Select Committee of the House of Lords recommended the construction of a complete inner circle and in 1864 Parliament gave the necessary sanction by authorising an extension of the Metropolitan from Moorgate to Trinity Square, Tower Hill, and incorporating the District to build the southern section between Kensington and Tower Hill. The Metropolitan, which worked the District in its early years, completed its own line only to Moorgate and made repeated but unsuccessful applications to Parliament for powers to abandon the section beyond. Eventually the extension from Moorgate to Aldgate was taken in hand and this section completed on November 18, 1876. The District company's powers eastward of Mansion House station lapsed in 1870. Space will not permit of detailing the long delays and costly Parliamentary contests of the next ten years, during which the Metropolitan showed an increasing unwillingness to facilitate or even allow the completion of the Circle. This attitude was accounted for in part by the various westward extensions of the District, each of which made it more apparent that the link would benefit mainly the District as offering a more direct route to residential suburbs and covering more points of interest than the Metropolitan. Other considerations were the hopes of the Metropolitan to buy up the District at a low figure, and also the personal animosity between Sir Edward Watkin, the Metropolitan (and South Eastern Railway) Chairman, and Mr. James Staats Forbes, the District (and London Chatham & Dover Railway) Chairman.

When it became obvious that the existing companies could not agree to complete the link, independent city interests took the matter in hand and formed the Metropolitan Inner Circle Completion Railway Company, which was incorporated on August 7, 1874, to build a line from the District at Mansion House station to the Metropolitan at a point north of Aldgate. Street improvements were also proposed and various public authorities undertook to contribute towards the cost of these. An agreement with the District was effected and a prospectus was issued in November, 1877, but the money was not forthcoming from the public. In the words of *The Railway News* "Sir Edward Watkin exerted all his influence to prevent the company raising the necessary capital, and his efforts were crowned with success." Nevertheless, the Metropolitan realised that powerful forces were determined to see the completion of the work and eventually Sir Edward Watkin was induced to work harmoniously with the District. The Metropolitan and District (City Lines and Extensions) Act of August 11, 1879, provided for the cesser of the independent company's powers under conditions of compensation, and it was by virtue of this Act that the link was ultimately completed, half a century ago, jointly by the two older companies. Parliament wished, however, to circumvent further friction and section 89 of the Act of 1879 required that "Each of the two companies shall, for the purpose of securing to the public the advantage of the continuous working of the said Inner Circle with the other portions of the two Companies' lines, work over the railways of the other Company forming part of such Inner Circle." It is this clause which the London Passenger Transport Board, as successor to both the Metropolitan and District Railways, desires, in the changed circumstances of the present day, to have repealed so as to have complete freedom of action to arrange services to the greatest public advantage.

Transport Legislation in the Irish Free State

CHANGES of great importance in the position of the railways in the Irish Free State have been made by the two Acts of Parliament recently passed in that country, namely the Railways Act, 1933, and the Road Transport Act, 1933. The railway measure applies to the Great Southern Railways Company, which now owns or operates all the railways situated exclusively in the Free State. In its present form this company is the creation of the Railways Act passed by the Free State Legislature in June, 1924, by which four "amalgamating companies"—the Great Southern & Western, Midland Great Western, Dublin & South Eastern, and Cork Bandon & South Coast—and 22 "absorbed" undertakings were consolidated into one system, the united undertaking under its present title being dated from January 1, 1925. By the same Act was constituted a regulating body under the title of the Railway Tribunal, which in effect possesses in itself powers over the Great Southern Railways similar to those vested in the Railway Rates Tribunal and the Railway and Canal Commission over the four group companies in Great Britain. Among the obligations placed on the Great Southern Railways Company by the Act of 1924 was to take over a number of light railways constructed partly with capital guaranteed by the "baronies" which they served. None of these lines was paying its expenses, and the sum required to meet their guaranteed dividends amounted to £47,288 per annum. Under the Act of 1924 the Government shouldered this liability—but only until 1934.

Great things were expected last year from the new legislation which the Free State Government had promised for putting the transport system of the country on a sound footing. The Railways Act proved, however, to be a disappointment. No relief is granted to the Great Southern Railways in the matter of baronial guarantees, so that the company is now faced with an additional liability of £47,288 a year. It is true that the long standing debt of £285,900 due to the Government by the company has been remitted, which means a saving of £15,000 a year in interest, but the contributory superannuation scheme which has been framed as required by the Act will probably involve additional payments of about £16,000 a year. There are indeed provisions in the Act which enable the company to abandon branch lines and dis-

continue unremunerative services, even in spite of previous statutory obligations to maintain them, but attached to the exercise of this power are onerous and expensive conditions and alternative costs which render the power in many instances valueless. Before any such abandonment or discontinuance can take place the consent of the Minister of Industry and Commerce has to be obtained, and when obtained is subject to the obligation to substitute adequate services and pay compensation to employees affected. In the matter of rates, however, relief is afforded by the provision that flat rates, irrespective of distance, may be quoted for any particular merchandise at the discretion of the Minister. At the same time the Act arbitrarily reduces the capital of the company. Each £100 of the £7,767,123 ordinary stock existing at December 31, 1933, is now reduced to £10, each £100 of the £5,068,464 four per cent. preference stock to £35, each £100 of the £3,885,374 four per cent. guaranteed preference stock to £50, and each £100 of the £8,323,797 four per cent. debenture stock to £85. On this basis the ordinary stock now stands at £776,713, the preference stock at £1,773,963, the guaranteed preference stock at £1,942,687, and the 4 per cent. debenture stock at £7,075,228. Last December the Railway Tribunal made an order fixing the company's standard revenue at £561,188, an amount which allows the earning of 5 per cent. on the reduced ordinary share capital. The company had applied to have the original standard revenue of £1,169,899 reduced by £530,918 to £638,981, which would have allowed the earning of 15 per cent. on that capital. By the Act of 1924 the number of directors was fixed at not more than 15 and not less than 12. Entirely of their own accord the directors had refrained from filling all casual vacancies until their number had actually fallen below the statutory minimum —a position which had to be made legal subsequently by an indemnity clause in the Act of 1931. The Act of 1933 arbitrarily reduces the number of directors to seven, and substitutes postal voting by ballot for the long-established system of proxy voting.

By way of contrast the Road Transport Act of 1933 is a really constructive measure, which has already been found of great benefit to transport generally as well as to the railways in the Free State. The general effect of the Act is to grant a controlled monopoly outside certain specified exempted areas to the three great existing transport companies, *i.e.*, the Great Southern Railways, the Great Northern Railway (so far as the Free State is concerned), and the Dublin United Tramways. This monopoly applies both to passenger and goods services, which all require licences, these three companies being able, with the consent of the Minister of Commerce and Industry, to obtain transfers of licences previously granted to other undertakers, subject to compensation to employees who had been for a defined period in the service of those undertakers. Schedules of the charges proposed for merchandise to be carried by road must be submitted to the Railway Tribunal, which has power to settle the schedules and fix the dates on which they will come into operation. Before the passing of the Act the Great Southern and Great Northern Railways had entered into an arrangement defining the areas in the Free State in which each company should operate road passenger services, and sharing the areas in which they had previously been to some extent overlapping. The latest co-ordination developments on the Great Southern Railways were set out in THE RAILWAY GAZETTE of January 19 at page 103, while the purchase by the Great Northern Railway of the Catherwood omnibus services between Dublin and Newry and in the Sligo-Londonderry sector was recorded on page 949 of the issue of December 22 last.

Railways and Airways

AT last the Imperial Airways routes to India and Africa are soon to become entirely—or nearly so—air routes, instead of air-cum-railway routes. Lord Londonderry, Secretary of State for Air, and Colonel Shelmerdine, Director of Civil Aviation, together in Rome, have persuaded the Italian authorities to permit British aircraft to fly over their country, and it is expected that by the summer the route from London to the East and to South Africa will be by way of Marseilles, Rome, and Brindisi and thence, as at present, to Alexandria and onwards—all by air except for the 130-mile journey between Alexandria and Cairo, which will continue to be by rail. Thus, after two years, the railway journey of two nights and a day between Paris and Brindisi will be eliminated and a day will be saved in the end to end journey. We cannot help regretting this, for it seems to us that the railways, as such, have lost a great opportunity. The 1,134 miles by rail from Paris to Brindisi need not have taken so long if the railway administrations of the three countries concerned had made a determined effort to retain the traffic. A special fast light railcar or train, after the style of The Flying Hamburger, could have covered the distance easily and economically within 24 hours, and, although it might seem that the number of passengers at present using the Imperial Airways route was too small to justify the expense and trouble entailed, it should not be forgotten that air transport is still in its infancy, and that the railways have scarcely begun to feel the effects of the competition which before long is likely to become really serious.

An indication of what may be expected shortly may be found in the report issued last Saturday of the meeting in Berlin of the International Air Traffic Association, the object of which was to arrange the summer time-tables of the European airways network. Extensive intercommunication of the various services is being arranged, and through tickets by air from London to 150 Continental towns are to be available. Co-operation between air and rail, of a sort that presents itself in a service like that between London and the East, should not be neglected, for passengers are quite pleased to come to earth now and again and cover part of their journey on terra firma. There is also the consideration that rail transport is still more reliable than air transport, especially over such a route as that between Paris and Brindisi. That all is not lost yet, however, is indicated by the time-table issued by Imperial Airways Limited, showing the great savings in time which can be effected during the winter by the use of both rail and air transport for travelling between London and a number of Continental towns. The journey is by air from Croydon to principal air ports, such as Berlin, Frankfort, Geneva, and Marseilles, and thence by train. Imperial Airways add that the air companies concerned do not guarantee connections, nor provide transport to the railway stations, but, at any rate, the value of rail and air transport co-ordination is recognised, if somewhat inadequately arranged. They seem to be more progressive about this sort of thing in South Africa than in Europe. Mr. Pirow, the Union Minister for Railways, has recently announced that his Government, which took over the services of Union Airways Limited on February 1, intends to work the airways as a department of the South African Railways and in close co-ordination with the Government railway services. The Union Airways organisation maintains local services in South Africa, also providing good connections with the trunk line of Imperial Airways to Egypt and England, so that complete co-operation of all fast transport seems assured. Incidentally, all air pilots in the railway service are to be trained in blind flying so as to secure maximum safety and efficiency.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of Correspondents)

British Passenger Train Punctuality

4, Limerick Road,
Bristol
February 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—It is the custom, perhaps not altogether without cause, to throw mud at the British railway companies in regard to the low standard of punctuality with which they are sometimes content. It is no doubt true that different standards and results are obtained in different areas comprising one company, and with the idea of giving praise where it is due I send you the enclosed figures giving details of what I regard as a remarkable tribute to the efficiency of train operation, in this case north of the Border. The figures quoted are from my own accurate observations, and were the results of travel during the earlier part of January, over areas as wide as Berwick, Inverness, Coalburn, and Carlisle. Every class of passenger train was included from expresses down to branch and even mixed trains.

The northbound journey from Newcastle-on-Tyne is not included, although it should be added that the train was handed over at Berwick 27 minutes late (owing to foggy weather prevailing in the Leeds area). No fewer than 12 minutes of this was recovered by the engine between Berwick and Edinburgh.

Total distance travelled	956 miles.
Number of trains used	35
Number of trains punctual throughout	27

Details of Time Lost by remaining 8 trains :—

	Min.
By engine	15
,, signal delay	11
,, station delay	7
,, permanent-way slacks	Nil
Total	33

Details of Time Recovered by remaining 8 trains :—

By engine	20
At stations	10
Total	30
Net time lost	3

Yours truly,

C. R. CLINKER

High-Speed Steam Locomotives

54, Victoria Street, S.W.1.
February 2

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The article you published in your issue of January 26 will have attracted considerable attention, and while the proposed modified Pacifics (4-6-4) for high-speed passenger service are not particularly novel, the 4-4-2 design is undoubtedly very interesting. Presumably these three suggested forms of steam locomotive are to be taken as an answer to those who are inclined to think that for very fast running a type of diesel engined unit is the natural solution.

I am going to suggest that the steam locomotive can readily run as fast as any other type of motive power unit, and that actually the final arbiter on the question of possible speeds will be the physical characteristics of the road to be traversed. In practice the fastest regular running in this country to-day is, I think, between Swindon and London, and moreover in the direction indicated, and I am bold enough to suggest that the favourable character of the road is here the governing influence making the exceptional speeds attained possible.

One hesitates to enter upon any discussion on the relative merits of steam and diesel power for ultra high speed passenger trains within the limits of a communication of the present character, but there is one consideration which may be named, and that is the question of power required and the effect this will have on the fuel consumed per unit of work actually expended on the drawbar.

There is little doubt that running relatively light trains at very high speeds calls for a heavy fuel consumption for the work done on the train, even although the actual amount of coal fired during a specific run may be comparatively small, so small relatively as to be thought proof that high running speeds are not uneconomical so far as fuel is concerned. This is, however, far from being a fact, and the reason is the high power required to move the locomotive compared with the resistances of the coaching stock, meaning that the fuel rate per drawbar-horse-power-hour is high.

Presumably, whenever we use a separate power unit, whether it be steam or oil, there will be a considerable loss in efficiency as expressed by the ratio of the d.b.h.p. to the i.h.p. and it must be the aim and object of the steam locomotive designer to see that the differences between the thermal efficiency realised with the oil engine driven motor and that of the steam locomotive is not widened when each is applied to super-speed train operation.

When studying the Henschel 4-4-2 it is evident that this point has been appreciated, the large driving wheels and the stream lining being adopted in order to increase mechanical efficiency, but one rather wonders why poppet valves, which are, I think, better than those of the piston type, are not suggested. These, in conjunction with three cylinders might be an improvement.

The large diameter drivers remind us of Mr. Worsdell's 7 ft. 7¼ in. four coupled engines of 1896, while the design in general calls to mind Sir John Aspinall's 4-4-2 inside cylindered engines with 7 ft. 3 in. drivers of 1899, engines which always appealed to me as being particularly suitable for high speed running, but so far as I know experiments have never been made with them on the Western Division main line, which is probably the most suitable section of the L.M.S. system for really fast travelling.

Incidentally it may be observed that at 100 m.p.h. the Henschel 4-4-2 would make the same number of revolutions per minute as the Great Western *Tregenna Castle* at 90 m.p.h.

Yours faithfully,

E. CECIL POULTENEY

London,
February 2

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The details given respecting the high speed locomotives for Germany in your issue of January 26 are insufficient to allow one to form a definite opinion, but there are certain facts which attract one. In the first place the general design that most appeals to me is the fully streamlined six-coupled engine, but unless the load is sufficient it is difficult to see why this number of coupled wheels should be used, as each additional coupled axle naturally hampers the speed as the maximum is approached. With such a locomotive care in design would have to be exercised in order

to bring the centre of gravity at least 2 ft. behind the centre coupled wheels and very powerful lateral springs would have to be fitted to the bogie centre to ensure steady running. At such a high speed, swing link bogies would not give sufficient initial control. If the load is only light, I would favour a four-coupled, or better still—provided that the axle loads could be put up to, say, 25 tons—a single-wheel arrangement. With the steels used to-day the reciprocating weights could be brought down to a fine point. The suggested 100 m.p.h. does not, of course, by any means represent the limitation of speed possible with steam locomotives on well laid and fairly level tracks.

Yours faithfully,

EX-C.M.E.

The Royal Scot

London,
February 6

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Some time ago, after the introduction of the " Royal Scot " locomotives of the L.M.S.R. on the West Coast main line, the altitude of Shap Summit, which from time immemorial had been reckoned as 915 ft. above the sea, rose, for publicity purposes, to 1,000 ft. A similar upheaval appears to have taken place in Canada as a result of the recent successful journey of the *Royal Scot* across the North American Continent and back. As a tribute, doubtless, to Great Britain, the summit of the C.P.R. main line has been elevated from its traditional altitude of 5,326 ft. (vide " The Universal Directory of Railway Officials and The Railway Year Book, page 399) to 5,600 ft., since the *Royal Scot* ran over it. You quote the figure 5,600 ft. on page 824 of your December 1 issue of last year. Much has been made of the fact that *Royal Scot* hauled a " full load " up to this summit, whereas all C.P.R. trains require assistance; are we really to understand from this that 268 tons is regarded by the L.M.S.R. as a " full load " for this locomotive? By contrast, Mr. H. N. Gresley, who rode up this grade on the footplate of one of the 2-10-4 C.P.R. locomotives specially designed for working over the Rockies, mentioned, at the meeting of the Institute of Transport at which the Royal Scot film was shown, that the weight of this train was 1,100 tons, and said nothing of any assistance having been provided. Nevertheless an L.M.S.R. official is reported in the *Lancashire Daily Post* as having stated, at the exhibition of the Royal Scot train at Preston, in January, that *three* engines are necessary to work every Canadian train up the gradient over the Great Divide which the *Royal Scot* tackled, with " full load," unassisted. The exploits of the *Royal Scot* overseas (where, despite the evidence of your columns to the contrary, I gather that no train normally travels at more than 40 m.p.h.) are thus well on the way to becoming legendary.

Yours faithfully,

" MOTHER OF SIX "

PUBLICATIONS RECEIVED

Kalender : Nederlandsche Spoorwegen, 1934.—The Netherlands Railways administration has sent us a copy of its calendar for the present year, which is of the wall variety but provided with spaces to enable it to be used as an engagement calendar. It is printed in a very distinctive style, and there is an excellent photograph in the centre of each monthly page depicting the various activities of the railways. By the courtesy of the management we are enabled to reproduce some of these on page 216 of this issue. Month by month particulars are given of the numerous facilities offered by the Netherlands Railways, the availability of tickets ; party rates ; childrens, excursion, and holiday tickets; through goods and cattle services ; working arrangements with tramways, light railways, and bus undertakings ; and journey times between the principal cities for express goods trains. Reference is also made to the coming introduction of electric and diesel-electric services on various sections. The price of the calendar is 0·40 florin, and it can be obtained by sending this sum to the Publicity Department at Utrecht.

The Law Relating to Carriage of Goods by Land in a Nutshell. By J. A. Balfour. 1934. London : Sweet & Maxwell Limited, 2 and 3, Chancery Lane, W.C.2. pp. 59. 8¼ in. by 5½ in. Boards. Price 3s. 6d.—As the preface states, this book is primarily intended for the use of candidates for the Bar Final Examination and to supply them, within the limits of a few pages, with the essentials of the law relating to the carriage of goods by land. It does not profess to be a text book, but a resumé for use after the student has read his text thoroughly.

The essentials are all in the book and they are set out so concisely and clearly as to appeal to anyone who is interested in the subject, whether as a student or not, and impress them on his memory. We have seldom seen the principles relating to the rights and duties of carriers by land set out so readably. There are no long lists of cases, but " Some leading Cases on Carriage " make a good finish to the book, which is fully up to date with particulars of the Road and Rail Traffic Act, 1933.

Road and Rail Traffic Act, 1933, by E. Gilbert Woodward. London : Eyre and Spottiswoode (Publishers) Limited, 6, Great New Street, E.C.4. 188 pp., index. 8¾ in. by 5½ in. Price 16s. net.—This book forms a useful companion to the same author's volume on the Road Traffic Act and the success of that work will ensure a welcome for its successor. There is a lengthy introduction in which the purpose and meaning of the various sections are set forth clearly and with an avoidance of legal phraseology and it is done so thoroughly that only in a few cases has it been considered necessary to interpolate notes in the text of the Act, which follows, except to include references to sections of other measures, which are printed in an appendix. The few other notes mainly refer to one or two points on which the wording of the measure is not so clear as it should be, although the intention of the Act is so clearly set forth that it is to be doubted whether it would be worth anyone's while to test any moot points in the Courts. In an appendix are printed the relevant portions of most of the Acts mentioned in the Road and Rail Traffic Act and, while it is handy to have these, we suggest that some means should be used to indicate which portions have been repealed or modified, so as to avoid confusion and constant cross-reference. It is a pity, too, that it was not considered worth while to include these extracts in the index, and we would suggest that the index should be edited at the first opportunity with the object of bringing together all the references to one subject.

Light Alloys.—A reprint from the *Journal of the Institute of Metals* on the new improved Alpax alloys, as well as a pamphlet which describes these alloys, has reached us from Lightalloys Limited, of Alpax Works, London, N.W.10.

Heat Treatment.—The Dearborn Chemical Company of Chicago, whose London address is Westmills, Exhibition Grounds, Wembley, has issued a pamphlet on the Dearborn water treating units and testing equipment.

Portable Cranes.—Stothert & Pitt Limited, of Bath, has issued a folder describing the patent Giraffe crane, a very handy piece of equipment for the contractor and builder, for it has an adjustable mast and a two-radius jib with a common winch group. The telescopic and easily adjustable mast will serve heights of lift between 20 and 32 ft with loads from 6 to 4 cwt., at a lifting speed of 90 ft. a minute. The fixed jib will take loads of 10 cwt. at 6 ft. 9 in. radius, and 6 cwt. at 9 ft. radius, with a lifting speed of 45 ft. a minute.

THE SCRAP HEAP

Typists on Trains, 1934

The London & North Eastern Railway announces a new facility for passengers; trained typists fully equipped with an office will be provided so that letters may be dictated, correspondence dealt with, documents typewritten, communications posted, &c., *en route*. The service on which this will be provided is the 8.15 a.m. express from Newcastle-on-Tyne to King's Cross and the 5.30 p.m. express from King's Cross which reaches Newcastle at 10.37 p.m. The journey of 268 miles each way is covered in just over five hours. A special dictating compartment will be set aside in addition to the business office, and reasonable charges for the services provided will be made on the basis of prevailing rates for stenographic work. This is the first time that a modern business office has been installed on a British railway train. It is proposed to begin the service on Monday next, February 12, with the 5.30 p.m. express to Newcastle.

Typists on Trains, 1910

Considerable interest has been aroused in the "City to City" express restaurant-car trains which the London & North-Western Railway inaugurates on February 1. As announced, these will run between Wolverhampton, Birmingham, Coventry and Broad Street station, London, which is within four minutes' walk of the Bank of England. The up train, with breakfast-cars attached, leaves Birmingham at 8.20 a.m. and is due at Broad Street at 10.35 a.m. The down train, with dining-cars attached, leaves Broad Street at 5.25 p.m. and is due at Birmingham at 7.40. A shorthand-typist, who will work in a reserved compartment to ensure privacy, has been engaged for the convenience of passengers on these trains. The North Western trains run so smoothly that typewriting on board them is easy.—*From "The Railway Gazette" of January 28, 1910.*

(*See also news paragraph on page* 226)

* * *

THREE KNIGHTS IN ONE DAY

At the meeting of the Retired Railway Officers Society last Tuesday afternoon, Sir Henry Fowler, Sir Arthur Watson and Sir Felix Pole were elected as members. A former Superintendent-of-the-Line of one of our leading railways characteristically remarked: "Is this becoming a (k)night club?"

* * *

Porter (hot and fagged, carrying heavy bags): "Where for, sir?"

Passenger (slightly incoherent): "Dunmow."

Porter: "Dunno? ! ! !, and I've carried these 'ere blinkin bags right acrorst the station."

* * *

The boiler for Timothy Hackworth's *Sans Pareil* was constructed at Bedlington, and stood the test of over seven years. The last of the seven-foot gauge engines running was also made at Bedlington for the Holyhead Breakwater Railway in 1852; it conveyed a train in which King Edward, then Prince of Wales, was carried when he opened the breakwater works on August 19, 1853; at the driver's request he named it *Prince Albert*.

Sir Daniel Gooch records that when taking over the Stratford-on-Avon Railway for the Great Western, he found rails that had been rolled at Bedlington in 1830.—*Notes on the Bedlington Ironworks from "The Newcastle Weekly Chronicle."*

* * *

NEW G.W.R. SLOGAN

Below is a reproduction of a new Great Western Railway slogan which appears at the bottom right-hand corner of the notepaper used by the Chief Goods Manager's Department.

GETS THERE
WITH
RAPIDITY

* * *

A schoolboy reader writes to us: "I think that Mr. Collett ought to bring out a new loco. to stump the L.M.S. and Mr. Stanier, and call it *The Loch Ness Monster*." But would not that be a more suitable name for the L.N.E.R. "Hush Hush" engine, No. 10000?

* * *

We are indebted to Mr. John Phillimore for lending us, from his very fine collection of railway relics, the copy of "The Comic Bradshaw" from which were taken the amusing sketches of railway passengers in 1848 reproduced below.

Railway Passengers in 1848

as portrayed in "The Comic Bradshaw, or Bubbles from the Boiler," by Angus R. Reach, illustrated by H. G. Hine, and published by E. Bogue

The First-Class Passenger

"He hath an infinity of luggage, and no end of cloaks, wrappers, plaids, and pilot-coats. He is particular about a brass-bound dressing case and he deposits one of his outer garments in a compartment of the carriage, so as to take possession"

The Second-Class Passenger

"Sometimes he walks to the station baggageless—at others, he comes in company with a carpet-bag on the top of the omnibus. When he wears a pair of gloves, he sticks his ticket into one of them"

The Third-Class Passenger

"If his luggage does not consist of a bundle tied up in a blue spotted cotton handkerchief, it is sure to be comprised in a ponderous wooden chest. He sticks his ticket in the band of his hat, as a visible sign that he has paid his fare"

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

Suggested Argentina–Brazil through bookings—Purchase of diesel-electric railcars for Madras sanctioned—Indian 1934-35 capital programme—Remodelling of Prague railway system—Commercial representation at Italian time-table conferences—Polish fare reductions

BRAZIL

Proposal for Through Traffic to Argentina

At a recent meeting of the Commercial Association at Caxias, in Rio Grande do Sul, at which Snrs. Aymberé Drumont and Ildefonso da Silva Dias, representing the Viação Ferrea do Rio Grande do Sul, were present, Snr. Drumont explained to the business men and exporters the terms of an agreement which was being studied by the Viação Ferrea and the Argentine North-Eastern Railway, for the establishment of through traffic arrangements, whereby it would be possible to ship goods direct, viâ Uruguayana and Libres, to any locality in the neighbouring Republic served by the North-Eastern Railway. Although transhipment would be unavoidable, on account of the difference in gauge (metre and standard 4 ft. 8½ in.), the object of the agreement was to eliminate the handling of the goods by a third party at the frontier, and, in regard to Customs formalities, there would be no difficulty, as the Viação Ferrea intended to make itself responsible for the rapid forwarding of goods to destination.

Central of Brazil Electrification

Although the final signing of the contract with the Metropolitan-Vickers Electrical Co. Ltd. is still dependent on the Finance Minister's examination and report, it has been possible, as the outcome of arrangements come to with British bankers, to obtain valuable concessions in regard to the payment for the work of installation and equipment. Subsequent to conversations with one of the bankers' agents in Brazil, in the presence of the Metropolitan Vickers representative, the Minister of Communications announced that it had been agreed to subdivide the financing of the electrification as follows:—

The first section to be electrified, consisting of the suburban lines between Dom Pedro II and Nova Iguassú and the Santa Cruz branch as far as Bangú, will cost £1,411,913 in all—exactly half of the estimate for the whole work—this amount to be payable within a period of four years (from January 1, 1935, in place of the 2½ years' term originally fixed. On this basis, the monthly remittances, in sterling drafts issued by the Bank of Brazil, will amount to £30,000 including interest, and the resultant total annual payment of £360,000, instead of £564,000, in accordance with the previous arrangement, will reduce considerably the burden on the exchange market. Once this first section is completed, the second, consisting of the Bangú-Santa Cruz suburban length and the remainder of the outer suburban and main line from Nova Iguassú as far as Barra do Pirahy, together with the Belém-Paracamby branch, will be put in hand, and financed on similar lines.

Freight Reductions on Federal Lines

A Decree was signed on December 14 conceding, for a period of five years, on all railways administered by the Federal Government, a rebate of 10 per cent. in the rates on all products forwarded by agricultural associations and recognised groups of settlers that have already been established for less than a year, or that may become established within two years of the present date, within 15 km. on each side of the respective railways. A similar rebate is to be made (with the maintenance of the minimum rates actually in force) on machinery and plant for the installation of capital equipment; and, in regard to those agricultural and industrial products which up to the present have never been exploited in the zones in question, rebates will be allowed amounting to a 20 per cent. reduction on the existing printed rates.

INDIA

National Airways

Interesting figures of the first month's operation of the services of the Indian National Airways are now available. The number of miles flown by the company's aircraft during December were 16,500. About 3,200 miles were flown on short flights and special charters, and 851 passengers were carried. Of these, 102 travelled on the Calcutta-Dacca route, 43 on the Calcutta-Rangoon service and 706 enjoyed short flights at Calcutta, Dacca, and Rangoon. Every aeroplane engaged on schedule flights arrived on time. Local business men, it appears, are using airways in increasing numbers. The air services are, therefore, likely to develop into a powerful competitor in the transport services. It is desirable that the railways should take careful stock of the position especially in regard to their upper class services. The number of passengers travelling in the upper classes has been steadily decreasing of recent years and suggestions have been made for replacing the first and second classes by a single class.

Diesel-Electric Railcars

The Agent of the Madras & Southern Mahratta Railway considers that the increasing road motor competition can be effectively countered by cancelling certain short-distance steam trains and substituting for them a faster and more frequent service of railcars. The Railway Board, concurring with this view, has accepted the proposal of the railway administration for the purchase of six diesel-electric railcars as an experimental measure at an estimated cost of Rs. 3,60,000. It is intended to run railcar services on the Uadepalligudem - Rajamundry, Nidadavolu - Rajamundry, Samalkot-Coconada and Coconada-Kotipalle sections; it is estimated that 484 train-miles of the existing steam services will be replaced by 1,160 car miles. In spite of the increased car mileage, the company expect to save over Rs. 70,000 per annum in working expenses. If this expectation is realised, the estimated cost of the six railcars will be recouped in the course of about five years.

Railway Capital Programme for 1934-35

The Standing Finance Committee for Railways recently met under the presidency of Mr. P. R. Rau, Financial Commissioner of Railways, to examine in detail the capital programme for the coming year, prepared by the Railway Board in consultation with the various railway administrations. The approval of the committee was obtained to the following programme of works:—

	Capital	Depreciation Fund	Total
	Lakhs	Lakhs	Lakhs
Rolling stock ...	62	265	327
New construction ...	11	—	11
Open line works ...	392	505	897
Emergencies	5	5	10
	470	775	1,245
Less reduction of stores balance	70	—	70
	400	775	1,175

The committee had already approved of the expenditure of Rs. 307 lakhs on rolling stock, but Mr. Rau explained the reasons for the increase in the present demand, the most important contributory items being: (1) the addition of 282 broad gauge wagons costing Rs. 13 lakhs required for the South Indian Railway consequent upon the conversion to broad gauge of the Shoranur-Cochin Railway; and (2) the purchase of six diesel-electric railcars for the Madras & Southern Mahratta

Railway at a cost of about Rs. 4 lakhs. In anticipation of the sanction of the committee, the Railway Board included in the call for tenders 282 broad gauge wagons, over and above the 2,600 wagons originally proposed for purchase.

The expenditure on open line works next year will be over a crore in excess of the current year's budget, and is spread over the following main heads:—

	Capital	Depreciation Fund	Total
	Lakhs	Lakhs	Lakhs
Works in progress ...	96	47	143
Track renewals ...	85	391	476
New works	211	67	278
	392	505	897

The new works include (*a*) the rebuilding of the Gorai bridge on the Eastern Bengal Railway at a cost of Rs. 24 lakhs, of which Rs. 8 lakhs will be spent in 1934-35; (*b*) extension of the power house in the Kharagpur workshops, B.N. Railway; (*c*) remodelling of the Jamalpur workshops, E.I. Railway; (*d*) a new hospital at Lahore, N.W. Railway, and (*e*) a new hospital at Calcutta, E.B. Railway.

New Construction

The provision of Rs. 11 lakhs under new construction next financial year against Rs. 32 lakhs in the current year is largely intended to bring to a completion projects already in hand. A sum of Rs. 3½ lakhs is included to cover the cost of construction of a small line in Southern India, the Agastiyampalli - Point Callimere Railway, which the Government of India has undertaken to construct as part of the terms on which the Tanjore District Board lines were handed over to the Government. The Financial Commissioner of Railways, however, informed the Standing Committee that several projects, such as the Megna Bridge on the Assam Bengal Railway and the Bombay-Sind connection were under active consideration. None of them had progressed far enough to justify special provision in the budget for the next year. If detailed examination showed that any of these were likely to be remunerative and it was possible and desirable to start construction during 1934-35, fresh proposals would later be placed before the committee, and if they agreed, additional grants would be obtained from the Assembly.

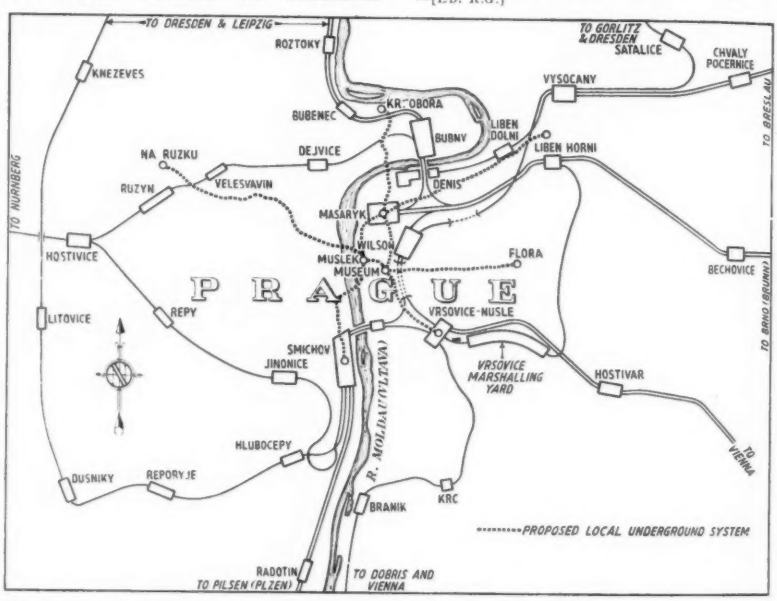
CZECHOSLOVAKIA

Prague Railway Problem

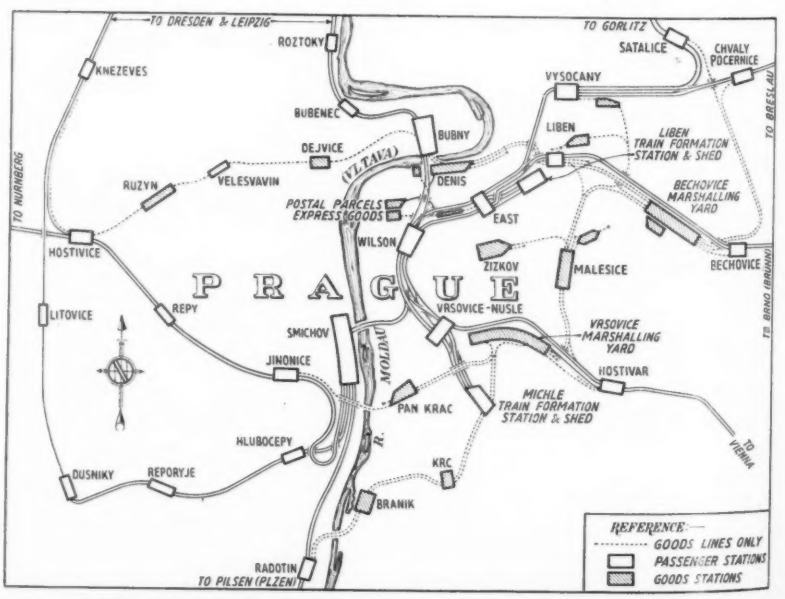
Originally each of the various private railways entering the capital of Bohemia built its terminus regardless of easy communication with other lines. As a result, a great deal of expense was incurred in an endeavour to co-ordinate the working of the different main line routes, when, later, they became part of the Austro-Hungarian State system. During the war a loop line was constructed connecting the two stations of Vršovice and Libeň, to the south and east of the city, thus affording direct communication between the then important Prague-Vienna line and the one communicating with the eastern Bohemia and the surrounding districts. As long before that, however, as 1908 the Austrian authorities had determined on the construction of a large marshalling yard near the Vršovice station, to be served by this line, and work was commenced in 1913. By the end of the war only the preliminary works had been completed, and it was not till five years later that all the tracks were laid. The re-drawing of the frontiers altered the conditions altogether, causing the Prague-Vienna line to lose much of its importance,* the main currents of traffic taking new routes in the territory of the Czechoslovak Republic. A commission was appointed to deal with the question of city planning, and its railway proposals are shown on the second of the two maps reproduced, the first indicating the existing situation. These maps and the accompanying notes are taken from the October, 1933, issue of the *Revue Général des Chemins de Fer.*

The leading idea of the scheme is

* Vide page 858 in THE RAILWAY GAZETTE of December 8 last, where is illustrated and described the Nord-West station in Vienna closed in 1924 on account of the loss of importance of the Vienna-Prague line. —[ED. *R.G.*]



Map of present arrangement of railways in Prague, showing also proposed underground system



Map showing the proposed remodelling of the Prague system

the separation of the passenger from the freight traffic and their allocation to different stations. The present Wilson station will become the main central station for both long distance and the principal suburban routes. The Denis and Masaryk passenger stations will be abolished, a small portion of the latter, however, being retained for express freight and parcels traffic. The space so released will be used for city improvements. Certain new suburban lines or services will be concentrated on the Wilson station, from which all train formation work will disappear, to be performed in future at new groups of sidings to be built elsewhere. The goods yards at the Wilson and Masaryk stations, now the nearest to the centre of the city, will be closed. Two new yards are to be built, and those at the Denis, Smichov, and Bubny stations will be enlarged.

One of the new goods stations, Žižkov, which has been under construction since 1928, is situated about 3 km. from the middle of the city and, when completed, will enable the above-mentioned changes to be carried out, thus freeing the central district of buildings and railway lines which constitute an obstacle to the making of much needed improvements. The Žižkov yard will have more than thirty tracks and be equipped with the latest apparatus for the expeditious working and handling of freight. The other large yard is to be constructed on ground known as the Mainach plain, made available by reclamation and other works in connection with the River Vltava (Moldau). The marshalling work for trains using the new goods stations will be performed at the two hump yards, viz., that at the Vršovice station, already partly at work, and another one to be built to the east of the city near Kyje.

SPAIN

Derailment of Madrid - Santander Express

On January 24, the Madrid-Santander express was derailed* near Santander, causing the loss of four lives, and injuries to several passengers. The accident occurred in a deep cutting, where recent heavy rains had caused a landslide, which fouled the track. In the section in which the accident occurred, visibility from the engine cab is not good, owing to the winding nature of the track, and although the driver of the express saw the obstacle he had not sufficient time to bring the train to a stop. The driver, fireman and two passengers were killed. The first coach, which was a third-class, contained only one passenger, who, although the carriage was reduced almost to matchwood, escaped uninjured.

One aspect of this unfortunate accident, which has caused no small amount of comment, is the fact that this section of line has been subject to a permanent watch, with the express purpose of avoiding any such accident, but that this watch was withdrawn on the previous day. The official responsible for the withdrawal of the watchman was arrested. The authorities have instituted an official inquiry, but the results have not yet been published.

* As recorded on page 149 of THE RAILWAY GAZETTE of January 26.— Ed. *R.G.*]

ITALY

Improved Services

At a recent time-table conference at Milan it was decided to continue the running of the Milan-Venice rapide permanently. A new rapide to Chiasso in connection with international trains was also announced, as was the institution of three Milan-Rome day trains in place of the present one. The latter are introduced in connection with the opening of the Bologna-Florence direttissima on April 21 next.* The Milan-Bolzano and Milan-Brenner services are also to be improved. Arrangements have been made between the State Railways and German State Railway for the institution of a Berlin-Rome rapide which will take only 23 hr. 55 min., a saving of 4½ hr. thus being effected. This new train also will start after the inauguration of the direttissima.

At the corresponding conference for Southern Italy the institution of a new night express between Milan and Bari was announced allowing passengers to reach either city in the early morning so as to give them a whole day to attend business and return the following night. There is also under contemplation a programme for introducing railcars in Southern Italy on a large scale. They are particularly suitable for that part of the country with its lighter passenger traffic as compared with northern Italy.

Time-Table Conferences

These time-table conferences are held twice a year and are convoked by the State Railways. They are attended by the representatives of other railway companies, of the Economic Provincial Councils, of the Chambers of Commerce, tourist associations (Governmental and local) and of other bodies interested in questions of transport. They therefore have the great advantage that the wishes of the directly interested parties are heard and their propositions on service improvements are always carefully considered by the State Railways Management which often adopts their suggestions.

Railways and Country Industries

The State Railways Administration has hired out 1,300 six-wheel vans to the Società dei Ferryboats coll' Inghilterra (Milan) for the English ferry service. Over half of these cars are provided with refrigerating equipment for the transport of fresh fruit and vegetables. The Administration is assisting the Ministry of Agriculture to encourage agricultural and horticultural development by instituting an original competition for the promotion of the national wines of the various qualities which are typical of different wine-growing districts, amongst the station restaurant keepers. The four main points upon which the judges will be called upon to decide are (1) the system adopted in the sale of the wines at the restaurants and buffets and on platform barrows; (2) the quality of the wine in relation to the price; (3) behaviour and attentiveness of the staff, and (4) the bottling by the restaurant keepers themselves. At the same time an extensive propaganda by means of posters, handbills and booklets will be carried on at stations. The judges are representatives of the State Railways, the Enit (National Office for Tourism), and of the National Federation of Wine Merchants.

An avalanche of about 50,000 cu. ft. extent recently occurred at the east of the tunnel between the stations of Noli and Varigotti on the Savona-Imperia line and obstructed the permanent way over a length of 400 ft., destroying the electric overhead lines. Passengers had to be diverted over the parallel route via Aurelia which, however, was also partially obstructed. The clearing of the railway and the repairs to the electric wires took two days. Two minutes before the avalanche occurred, a passenger train had passed the spot, so it was very fortunate that only material damage was done.

* The services over the direttissima were dealt with in an editorial on page 36 in THE RAILWAY GAZETTE of January 12.—[Ed. *R.G.*]

POLAND

Important Fare Reductions

A much-needed reduction in long-distance passenger fares came into force on January 1, the reduction applying to distances of 80 km. and upwards and reaching a maximum of 25 per cent. from 200 km. upwards. These reductions will benefit not only through international travellers, but also inter-urban passengers between Warsaw, Krakow, Poznan Lwow, Gdynia, Gdansk and Wilno, and holiday-makers proceeding to the coast and to the Carpathians. In addition, first-class fares have been specially reduced irrespective of distance by a further 20 per cent. as an offset to the very heavy falling off in the number of passengers using that class.

Concessions have also been revised and fixed proportionately to the former tariff, as follow:—

	Per cent.
School children, workmen, war invalids and state officials and their wives ..	50
Tourist excursionists	33·3
Railway personnel	80
Military and police	special fares

Special 1,000-km. tickets for skiers are now issued to members of ski organisations covering multiple journeys to and from winter-sport areas. Season and zone ticket fares have moreover been reduced by 25 per cent.

MINERAL DEPARTMENT ACCOUNTANCY MECHANISATION, L.M.S.R.

Completion of important scheme utilising the pre-punched card system

AN important accountancy reorganisation scheme, affecting one of the largest single units of accounting in the British railway industry, has recently been carried out successfully in the Mineral Department of the L.M.S.R. at Derby. This scheme, which had for its objects economy and the abolition of much tedious clerical labour, has involved centralisation of the particular accountancy work concerned in one office at Derby, and mechanisation on the pre-punched card system.

The work which the scheme has been designed to handle is the raising of charges, monthly, for the carriage of all the coal class traffic carried over the L.M.S.R. (excluding Scotland) from collieries situated on that system, and for the hire of all railway-owned wagons in which such traffic is carried. As this involves a monthly weight of approximately 4,000,000 tons at the present time and a debit of about £1,000,000, the detail work involved in the compilation of such an account is considerable, and any scheme of accounting, whether by hand or machine, must run smoothly and efficiently without the accumulation of an unwieldy peak period at any stage of the operations.

The old method of book-keeping involved the posting by hand into ledgers of approximately 300,000 traffic entries a month, together with the necessary casting, balancing, rating, calculating, and preparation of accounts by copying on to bills. This work was performed by male clerks at Derby and Manchester. At the close of the month's work, after the accounts had been rendered, a further considerable amount of clerical work was involved in summarising the entries in the form required by the Chief Accountant for the purpose of divisions with other railway companies concerned and general accountancy requirements.

Experiments in Mechanisation

The expense involved in these methods led the L.M.S.R. to experiment with mechanisation, together with centralisation of the work at one office. The fundamental requirements of a new scheme were that it would produce an account acceptable to the company's customers; produce the document in the minimum of time; and produce a monthly summary in pairs of points between collieries and stations, and a half yearly summary of certain traffic, for settlement with other railway companies. In 1929 it was decided to instal on an experimental basis a single battery of Powers-Samas accounting machines with a view to testing exhaustively the practicability of a full scheme of mechanisation. This initial caution proved justified, because experience showed that the usual application of the punched card system would have to be modified. The equipment of this system consists of cards, and punching, sorting, and tabulating machines. Generally, the cards are punched direct from the original documents as and when such documents are received in the office, but modification was achieved in a satisfactory way by the introduction of what is known as a pre-punched card system.

During the experimental stage it soon became obvious that the volume of work involved in the daily punching of the whole of the information required on the cards, created a difficulty which would have to be overcome before a fully workable scheme could be devised, and the system was adopted of pre-punching the cards. For regularly passing traffic, cards are prepared and punched in advance showing colliery, station, railway company, route, species, owner's or company's wagon, and rate per ton. These cards are filed for use as traffic passes, and replenishments of these files are automatically punched from master cards at a speed of 250 a minute on a Powers reproducing machine. As the result of experience these files have been built up to represent about 80 per cent. of the traffic passing.

Having proved by these tests the practicability of a complete mechanisation by the Powers Samas methods, the L.M.S.R. decided at the end of 1930 to proceed by stages with the change-over, and for this purpose the collieries on the system were grouped geographically into sixteen sections, the object being to introduce one section at a time as and when trained female machine operators became available. The full scheme, which is now in successful operation involves the use of 15 automatic punch machines, 1 hand punch machine, 13 sorting machines, 7 tabulating machines, 15 calculating machines, 1 reproducing machine, and 1 addressograph machine.

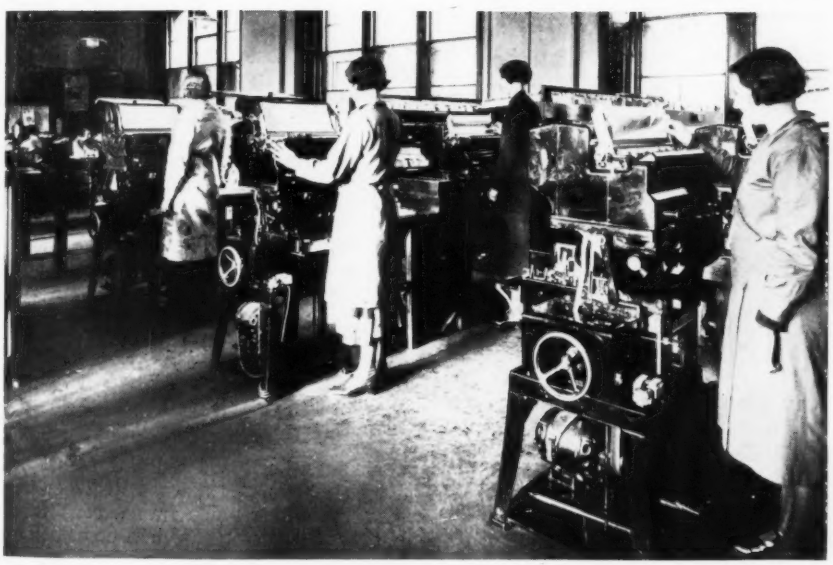
The Complete System

The function of the system is to raise a monthly charge for carriage of coal class traffic. The basis of this charge is a colliery consignment note or declaration, which comes into the hands of the railway company, generally at the nearest station, at which point " weight only " invoices are made out from the declarations and forwarded to each receiving station. These invoices are summarised monthly by the receiving stations, and thus form a check on the correctness of the weight charge in the accounts to the traders. After having been invoiced, the stations send, together with a daily summary of totals, the consignment notes to Derby, where they are allotted to their respective sections.

The first essential for the rendering of a correct account is a strict scrutiny of the consignment notes for the purpose of bringing out such salient features as private sidings, species of traffic carried, owner's and company's wagon, route, &c. This calls for local knowledge and is performed by male clerks. The second essential is a punched card to conform with the consignment note. In order to obtain a punched card, the consignment notes (after the original scrutiny) are passed to female file clerks who pull pre-punched cards from the file, using blank cards in cases of new traffic for which no provision has been made. The pre-punched cards, which, as already mentioned, represent approximately 80 per cent. of the total number, require further punching in respect of date, weight, and firm paying charges. The last-named information is in code, each customer being allotted a separate number. The remainder require punching in full, except that no rates can be entered on the cards at this stage.

Having reached the point where a card has been punched for every consignment note, the cards are passed through a tabulator which produces a print of the information punched on the card. This statement is checked with the original consignment notes for accuracy of charging and, as a tabulator automatically gives subtotals and grand totals, a daily balance is struck with the summary of weight invoiced by the invoicing stations. The consignment notes are not required beyond this point,

Right: Part of sorting (No. 2) room, showing Powers Samas sorting machines



Left: Powers Samas tabulating machines in No. 1 room

Below: Powers Samas punching machines and files in No. 1 room

as all subsequent operations are carried out by means of the punched card.

The next step is to arrive at the charges due on each consignment and for this purpose the cards are passed through the sorting machine. This operation automatically places the cards in order of rate, throwing out separately the 20 per cent. of new traffic cards referred to above. These are rated, the appropriate rate being punched on each card, checked, and merged in order of rate with the other cards, which are calculated and the amounts due punched. This completes the cards, which now contain all the information required in the account, but there remains the operation of checking the calculations. This is done by passing the cards, still in rate order, through the tabulator, printing in detail every item and, by a method of control on the tabulator, printing a sub-total at the end of every group of rates, with the grand total on completion. A check of calculations is carried out by calculating the total weight at each rate and, if this agrees with the total shown on the tabulated statement, the detailed calculations are thereby proved. Any difference in the total represents a corresponding difference in the detail calculations and this must be found and the cards corrected accordingly.

A further feature is that the calculating machines used in the check record a cumulative total of the calculation of the rates. This total, after allowing for differences found at each group of rates, must balance with the grand total shown at the foot of the statement checked. This completes the operations on a day's consignment notes and each day's traffic is dealt with similarly throughout the month, the cards being stored in files in customer-order, ready for the time when the month's work is completed.

The compilation of the accounts for rendering to customers is begun immediately the last day's consignment notes have been through the operations described. For this purpose the cards are automatically sorted on the machines into a prescribed order and then printed on the tabulating machine on account forms, the machines giving totals where required. The grand total weight of all the accounts issued is balanced with the month's "invoiced" weight.

One of the great advantages of the new system is the facility with which any desired result can be obtained through the medium of the cards. This becomes increasingly apparent in the next phase of the work. Under the old system a considerable amount of clerical work was involved, after the customers' accounts had been rendered, in summarising in pairs of points the whole of the traffic charged. This is now a purely mechanical operation, the cards having to pass through the sorting machines to be sorted in the required order and through the tabulating machines for the requisite printed statement. The grand total obtained from this series of operations must agree with the grand total of the customers' accounts both as to weight and charges raised. In addition to these monthly statements further statements are required covering six monthly periods and again these are readily compiled mechanically on the sorting and tabulating machines.

SMOOTH RUNNING BOGIES

Sheffield Twinberrow diamond frame passenger bogies, with mild steel axleboxes, designed for heavy metre-gauge passenger stock in India

THE Udaipur - Chitorgarh Railway (India), though it is a small metre-gauge system, has now some very fine rolling stock. Among others are a number of bogie coaches of modern design weighing as much as 28 tons. For these the administration has recently placed repeat orders with G. H. Sheffield & Co. (Engineers) Ltd., Westminster, for Sheffield Twinberrow passenger bogies of the type illustrated and described below.

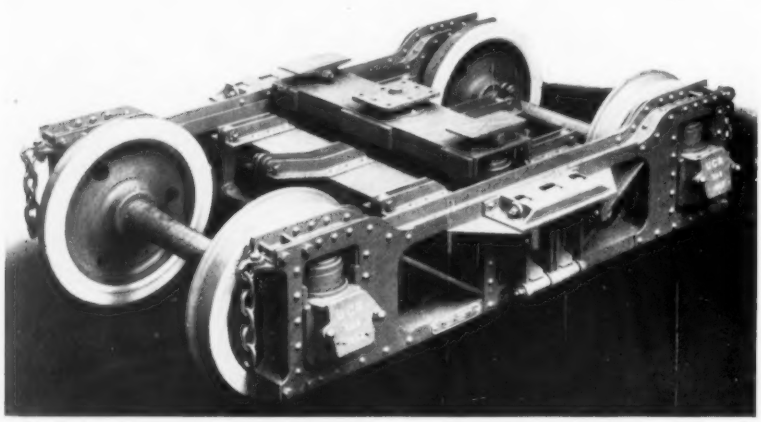


Fig. 1—Sheffield Twinberrow bogie with Framwel mild steel welded axleboxes

The leading dimensions of these bogies are: Wheelbase, 6 ft. 6 in., centres of journals, 4 ft. 8 in., diameter of wheels, 2 ft. 4½ in., size of journals, 7 in. × 4 in., weight of bogie without wheels and axles, 1 t. 12½ cwt., complete weight with wheels and axles, 2 t. 17 cwt. per bogie. The centre line of each side frame, consisting of standard channel bars and tension member, coincides with the centre line of the journals and axlebox springs. The lateral strength and stiffness, together with the balanced effect thus produced, ensures general rigidity and sustained easy riding and is such that headstocks on the bogie frame are not required, the brake blocks being slung on the inside of the wheels from the fixed cross bolsters. The width of the axlebox guides is 6 in. The load upon the channel swing bolster is carried upon a pair of pivoted side bearers which allow of longitudinal tilting without disturbing the even distribution on the side bearers or the bolster rubbing blocks.

The transmission of the load is through three sets of springs, two bolster Parabo volutes, guided in frames and resting on rounded knife edges upon two transverse laminated springs, and four Parabo volute axlebox springs. The end horncheeks, with renewable slippers, are bolted through the side frames top and bottom, and upon

Fig. 2—Framwel welded mild steel axlebox with retaining ring segments for volute or helical spring

Fig. 3—Fixed or pedestal type Framwel axlebox for diamond frame goods bogie with semi-tubular struts

removal, the wheels, axleboxes and springs may be run out clear of the bogie, or alternatively the axlebox springs may be taken out, without the bogie having to be unwheeled by jacking up the frame to the underside of the axleboxes.

Framwel Axleboxes

The axleboxes, illustrated in Fig. 2, are frame welded structures—patent applied for by G. H. Sheffield & Co. (Engineers) Ltd.—and known as the Framwel axlebox. The box consists of a light inner welded mild steel shell partly surrounded by a channel, which is an integral portion of the box. In a modified design the steel shell is entirely surrounded by a channel or fabricated frame. The whole box is interchangeable with the existing cast steel standards; the internal fixtures are welded into position before assembling and do not require machining. Upon the crown of the axlebox (Fig. 2) segments of a retaining ring are welded for volute or helical bearing springs, but in some of the modified types the box carries a welded retaining frame in which rests the buckle of a laminated axlebox bearing spring.

The strength of the Framwel welded box under impact test compares very favourably with a similar cast steel box, and is considerably lighter, as may be seen from the following test results:—

The test was a drop test made on a 8 in. by 4½ in. carriage type axlebox arranged to suit Sheffield Twinberrow bogies. A tup of 2 cwt. was allowed to fall freely through 12 ft. three times in succession on to the horn guide ribs, the box resting on a solid base. After three blows it was found that the horn guide ribs of the welded box had deflected $\frac{3}{16}$ in. in the direction of dimension *A*, whilst the distance *B* had decreased only $\frac{1}{16}$ in. A camber of $\frac{1}{16}$ in. was also found in the length of the guide. None of the structural welds was broken and only the facing weld at the junction of the sides and top showed any sign of stressing. After three blows the cast box had deflected in the direction of *A* $\frac{1}{8}$ in. and in that of *B* $\frac{1}{16}$ in. But at the second blow the box cracked on each side from the horn guide ribs to the mouth, a distance of 2½ in., and also showed signs of stress at the junction of the sides and bottom. Three further blows were given to each box under similar conditions without any further material damage. The weight of the cast steel axlebox was 3 qr. 2 lb., and of the welded axlebox 1 qr. 27½ lb., or 36 per cent. lighter.

Framwel Box for Diamond Frame Bogie

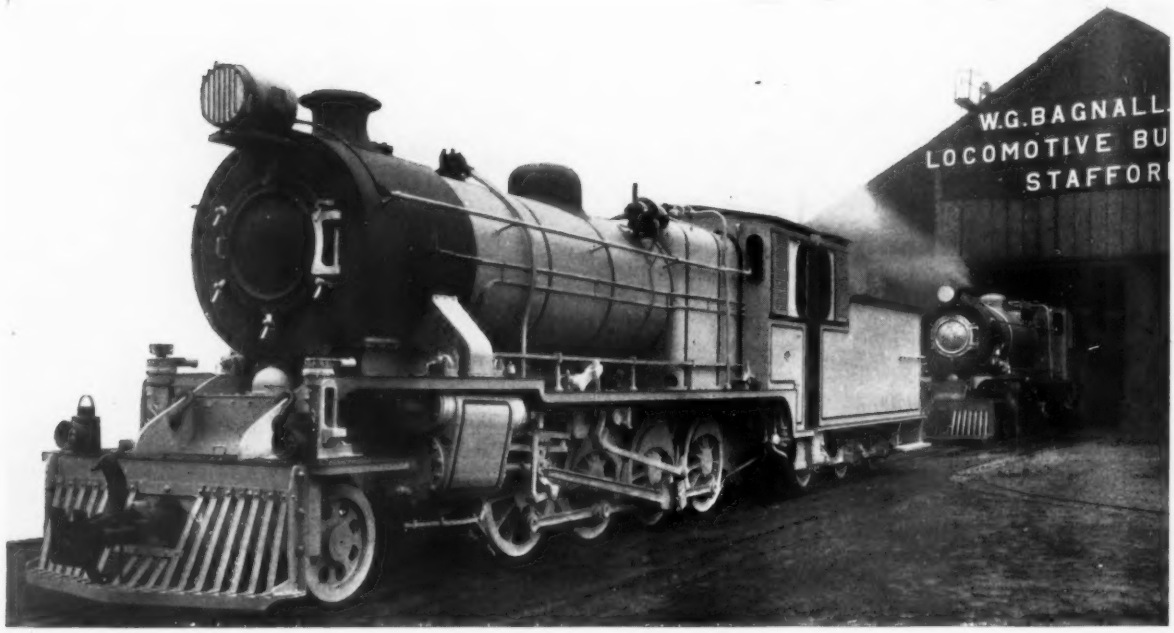
In addition to the type of Framwel axlebox just described there is another of the fixed or pedestal type for diamond frame goods bogies used under vehicles of 60 tons weight, illustrated in Fig. 3. In this type the channel frame surrounds the whole of the thin inner shell and may be reinforced at the retaining bolt centres by semi-tubular struts, although this is necessary only in the case of unusually heavy or eccentric loading. The weight of the box as illustrated is 62 lb., which is about 30 per cent. lighter than the corresponding cast steel box. All these types of boxes are designed to be interchangeable with any existing standard.

Track Circuits without Rail Bonds

An article in our American contemporary *Railway Signalling* raises the question of the practicability of eliminating rail bonding for track circuits by making the ordinary fishplate joints themselves sufficiently conductive. It appears that on the Missouri, Kansas & Texas Railway the rails have not been bonded on any track relaid since 1927, amounting to 125 miles of line. The discovery that it was possible to do this was made, it is stated, accidentally. According to the Signal and Telegraph Superintendent, Mr. J. A. Johnson, the results obtained are quite satisfactory as long as the permanent way department keep the fishplates bolted up tightly, while the fact that signal failures and consequent train delays will result if this is not done, is a direct incentive to them to see that their work is attended to. The Midi Railway of France does not now use rail bonding for electric traction or track circuiting where the short " chevron " fishplate is in use, but we are not aware of any attempt to do the same on any scale here, although we believe that isolated experiments have been made. Good electrical connection at the rail joints, however obtained, is essential, for without it the effect of the train shunt on any extraneous current likely to reach the track relay may be nullified. A track circuit is made to give the " occupied " indication, not by being interrupted but by being shunted. In other words, it depends for its operation on a contact being made, which is not, strictly speaking, in accordance with the principles of safe signalling which require any failure to give a warning. For this reason nothing which could possibly weaken the effect of the shunt, at whatever point it may be, should be permitted, and this must before all things be borne in mind when the rail bonding problem is being considered.

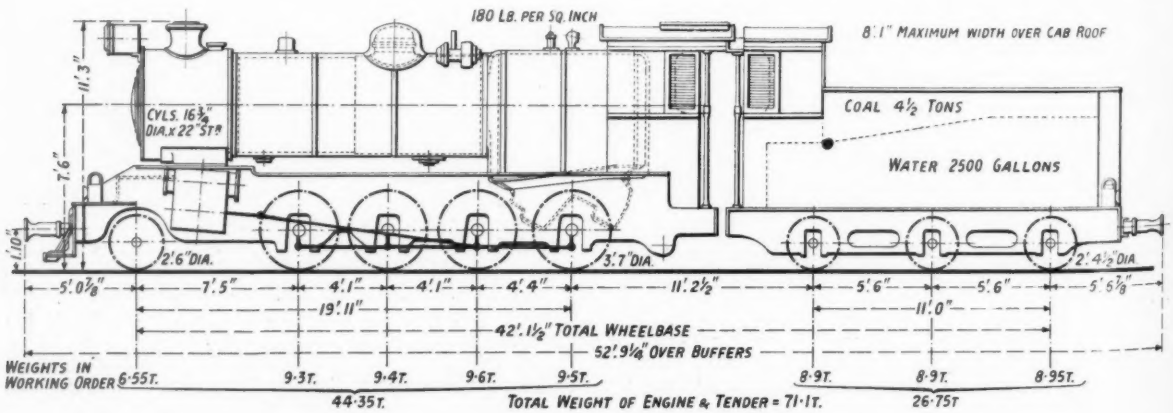
METRE GAUGE 2-8-0 LOCOMOTIVES FOR INDIA

Three freight tender locomotives have just been completed by W. G. Bagnall Limited, Stafford, for the heavily-graded Udaipur - Chitorgarh Railway



THREE locomotives, one of which is illustrated herewith, have recently been completed at the works of W. G. Bagnall Limited, Stafford, for the metre gauge Udaipur - Chitorgarh Railway. They are particularly interesting in design and based on a specification which is modern in every detail. The engines are fitted with specially large boilers and fireboxes so that an ample supply of steam can be ensured under all conditions. The firebox is of the wide type having straight sides over the top of the frame and the ashpan is of the self-dumping type with rocking grate. This and the drop grate are operated from the cab footplate, but the ashpan dumping door is situated outside the cab so that it cannot be operated whilst the locomotive is in motion. The circular smokebox is carried on a heavy cast iron saddle.

The springs of the engine are compensated in two groups, namely, those of the leading truck with the first and second pair of coupled wheels, and those of the driving and trailing pair of coupled wheels. The cylinders are located outside the frames and drive the third pair of coupled wheels, steam distribution being effected by Walschaerts gear actuating piston valves above the



Overall dimensions and weight distribution of metre-gauge 2-8-0-type locomotive

cylinders. The cab is roomy and provides an excellent lookout for the enginemen.

The following are the main particulars:—

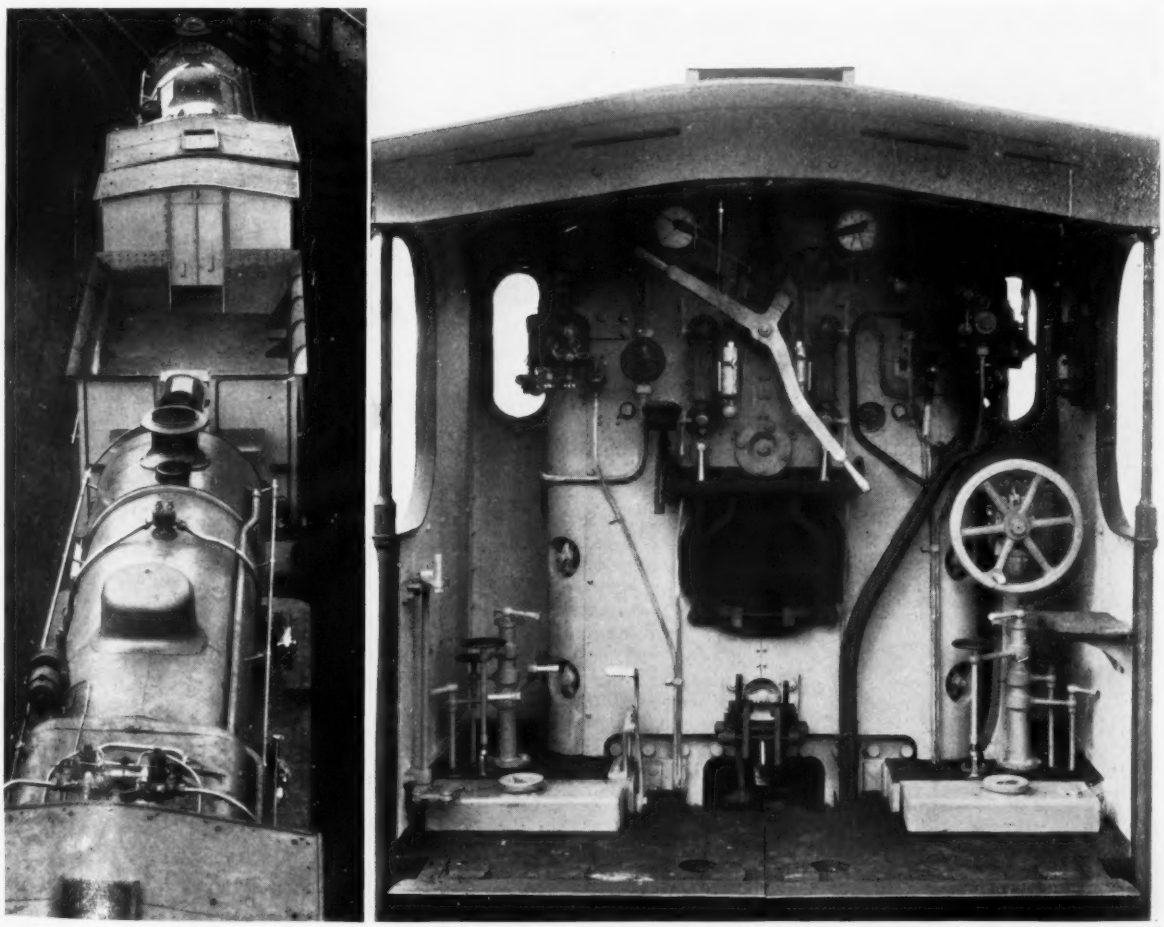
Cylinders, diameter	16¾ in.
,, stroke	22 in.
Wheels, coupled, diam.	3 ft. 7 in.
,, leading bogie	2 ft. 6 in.
Wheelbase, rigid	12 ft. 6 in.
,, total, engine	19 ft. 11 in.
Boiler working pressure	180 lb. per sq. in.
Heating surface, tubes	888 sq. ft.
,, ,, firebox	100 sq. ft.
Total	988 sq. ft.
Superheater	176 sq. ft.
Combined total	1,164 sq. ft.
Grate area	25·5 sq. ft.
Tractive effort at 85 per cent. of boiler pressure	21,980 lb.
Tender, water capacity	2,500 gallons.
,, coal ,,	4½ tons.
Wheelbase total, engine and tender	42 ft. 1½ in.
Weight of engine and tender in working order	71 tons.

The locomotives present a pleasing appearance and every detail has been carefully thought out with a view to accessibility and economy in maintenance. The tests carried out at the maker's works proved completely satisfactory. The locomotives are for use on the Ghat section of the Udaipur-Chitorgarh Railway, where grades of 1 in 50 are frequently encountered.

It is interesting to recall that six locomotives of a similar type and design, but having the 4-6-0 wheel arrangement and a slightly lower axle load were built by W. G. Bagnall Limited for the Gaekwar's Baroda State Railways in the early part of last year. These engines were illustrated in the issues of THE RAILWAY GAZETTE for June 23 and 30.

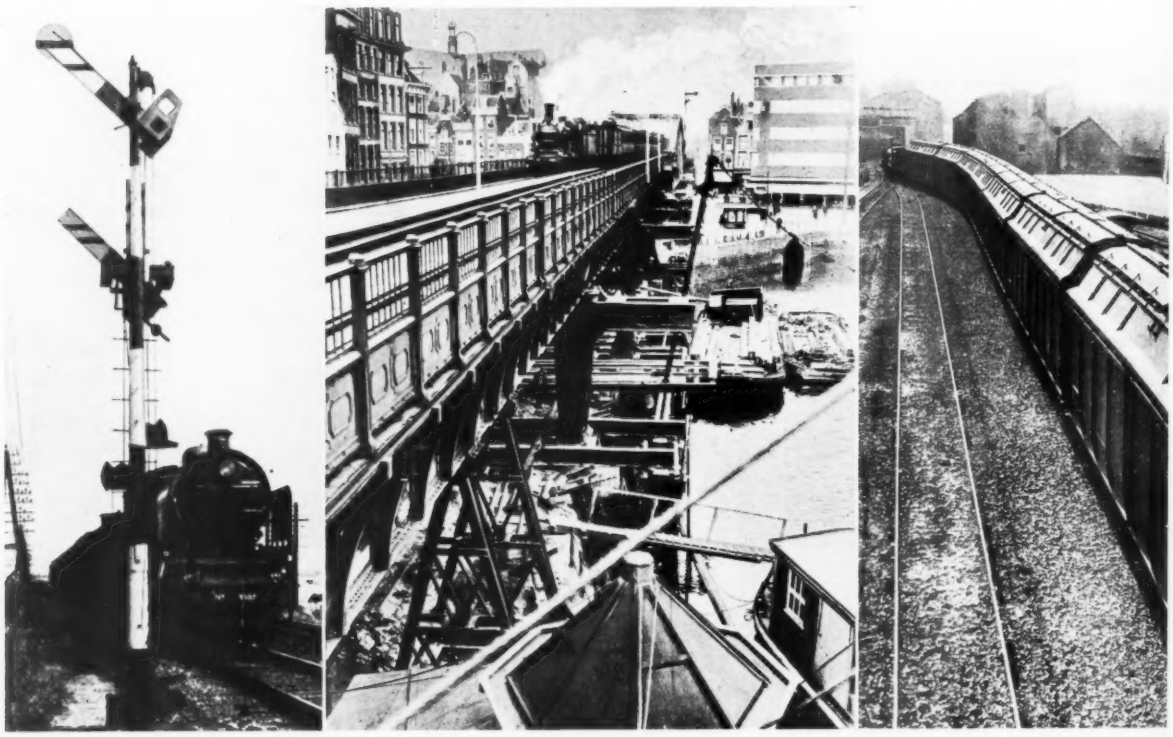
The equipment of the locomotives includes the following: Boiler mountings, water gauge, &c., Billington & Newton Limited; couplers, A.B.C. Coupler & Engineering Co. Ltd.; metallic packings, United States Metallic Packing Co. Ltd.; safety valves, R. L. Loss & Co. Ltd.; superheater, The Superheater Co. Ltd.; copper firebox plates and staybolts, Broughton Copper Co. Ltd.; injectors, Davies & Metcalfe Limited; blow-off cocks, Everlastin Valve Company; lubricator, Vacuum Oil Co. Ltd.; vacuum brake, Vacuum Brake Co. Ltd.; ejector with combined graduable steam brake valve, Gresham & Craven Limited; asbestos mattresses, Cape Asbestos Co. Ltd.; steel castings, wheel centres, &c., F. H. Lloyd & Co. Ltd.; tyres and axles, Monk Bridge Iron & Steel Co. Ltd.; screw jacks, Tangyes Limited; mouldings and casings, Langfields Limited; laminated springs, Thos. Turton & Sons Ltd.

(*See editorial note on page* 201)

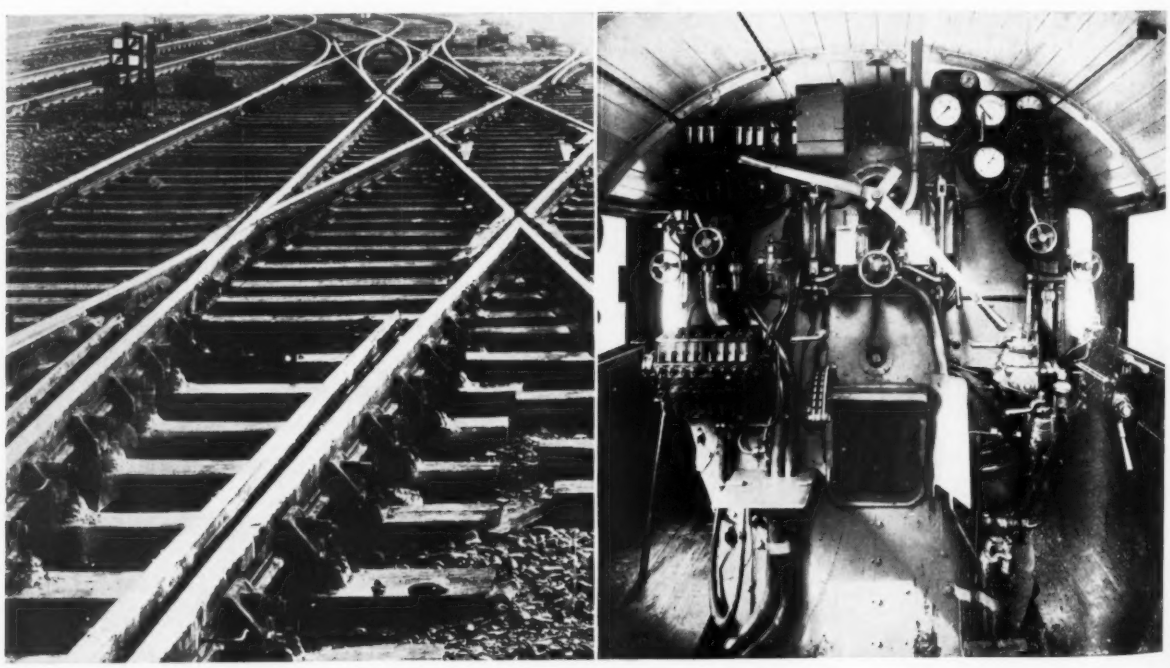


Bagnall metre-gauge locomotives for the Udaipur - Chitorgarh Railway, India
Views from above and on the footplate

MODERN VIEWS ON THE DUTCH RAILWAYS



Left: Maastricht–Amsterdam express passing a stop signal at "clear," beneath which is a three-indication junction distant signal indicating "proceed on the direct route." Note that one arm is vertically in line with the post. Centre: Strengthening viaduct near Rotterdam Stock Exchange station preparatory to opening of electrification in May. Right: Train of special refuse vans between the Hague and Drenthe



Left: Permanent way layout at Amsterdam Central station, showing shunting prohibition signal applying to track, indicated by arrow. Right: Interior of cab of 3900 class 4-6-0 heavy express passenger locomotive

RAILWAY NEWS SECTION

PERSONAL

We regret to record the death on January 31 of Mr. William Clow, C.B.E., sometime Superintendent, Southern Area, L.N.E.R.

Mr. Clow joined the Midland Railway in 1878, serving in various grades until 1895, when he was appointed to take charge of the traffic working and stores of the Midland & South Western Junction Railway. In 1902, however, he became Outdoor Assistant to the General Manager of the Great Central Railway, and in the following year was promoted to be Assistant to the Superintendent of the Line. Mr. Clow rose successively to be Assistant Superintendent in 1905, and Superintendent in 1910. At the time of the amalgamation in 1923, he became Superintendent, Southern Area, L.N.E.R., the position from which he retired in 1927. He was Chairman of the Superintendents' Conference, Railway Clearing House, in 1914, and during the war, served for a time on the staff of Sir Eric Geddes, Director-General of Military Railways, with the rank of Major, R.E.

The funeral took place last Saturday at Holy Trinity Church, Northwood, Middlesex. The vicar, in his address, paid eloquent tribute to Mr. Clow's high personal qualities, which had gained him widespread respect and affection, and to his indomitable courage through life and in the long months of suffering prior to his death. Among those present were :—

Sir Sam Fay, Messrs. E. A. Clear, S. L. Murgatroyd, A. Oldham, R. Mole, A. Wilson, C. J. Selway, V. M. Barrington-Ward, R. Pass, W. Backhouse, A. F. Bound, C. Carslake, H. G. Drury, R. H. Nicholls, T. Smith, F. Warrinder, and J. Procter Smith.

Mr. John Strachan, C.M.G., M.Inst.C.E., M.I.Struct.E., whose death we briefly announced in our last issue, was educated at Bath. After obtaining varied experience in railway and docks engineering, he entered the Ceylon Public Works Department in 1911, of which he afterwards became Assistant Director. In 1920, he was appointed Assistant Director of Public Works, F.M.S., and subsequently Director and, among other appointments, a Member of the F.M.S. Railway Board. Returning to Ceylon in 1923, he there held a number of posts, including the Directorship of Public Works. In 1927, Mr. Strachan was appointed General Manager and Chief Engineer, F.M.S. Railways and Chairman of the Railway Board, receiving the honour of C.M.G. in June, 1933. Last autumn he retired from this position and was appointed Director of Transport, Trinidad, where his death took place last week.

Mr. B. Baker, Manager and Chief Engineer of the Kowloon-Canton Railway, British Section, otherwise known as the Hong-Kong Government Railway, is retiring. He is to be succeeded by Mr. R. D. Walker, District Engineer, Federated Malay States Railways. Mr. R. D. Walker, M.C., M.Inst.C.E., D.I.C., was trained at the Royal College of Science, of which he is an Associate, and at the City and Guilds Central Technical College, South Kensington, where he took a post-graduate course in Railway Engineering, receiving the Diploma of the Imperial College. During the war he saw service with a Field Company, R.E., in France, Salonika and Egypt, 1915-17, latterly with the rank of Captain. From May, 1918, to May, 1920, he was with the Railway Operating Division, Egyptian Expeditionary Force, being O.C., R.O.D., from December, 1919, to May, 1920. In December, 1920, Mr. Walker was appointed an Assistant Engineer, Federated Malay States Railways, where he has more recently been Maintenance Assistant and Special Service Assistant to the Engineer for Way and Works, until his new appointment in China.

Mr. Joseph Shaw, K.C., sometime Director of the Great Western Railway, left estate valued at £111,000 (£85,677 net).

Major-General the Right Hon. Sir Frederick Hugh Sykes, P.C., K.C.B., C.M.G., Governor of Bombay, who has just received the honour of Knight Grand Commander of the Order of the Star of India, has been elected a Director

Elliott [*& Fry*

The late Mr. W. Clow, C.B.E.,

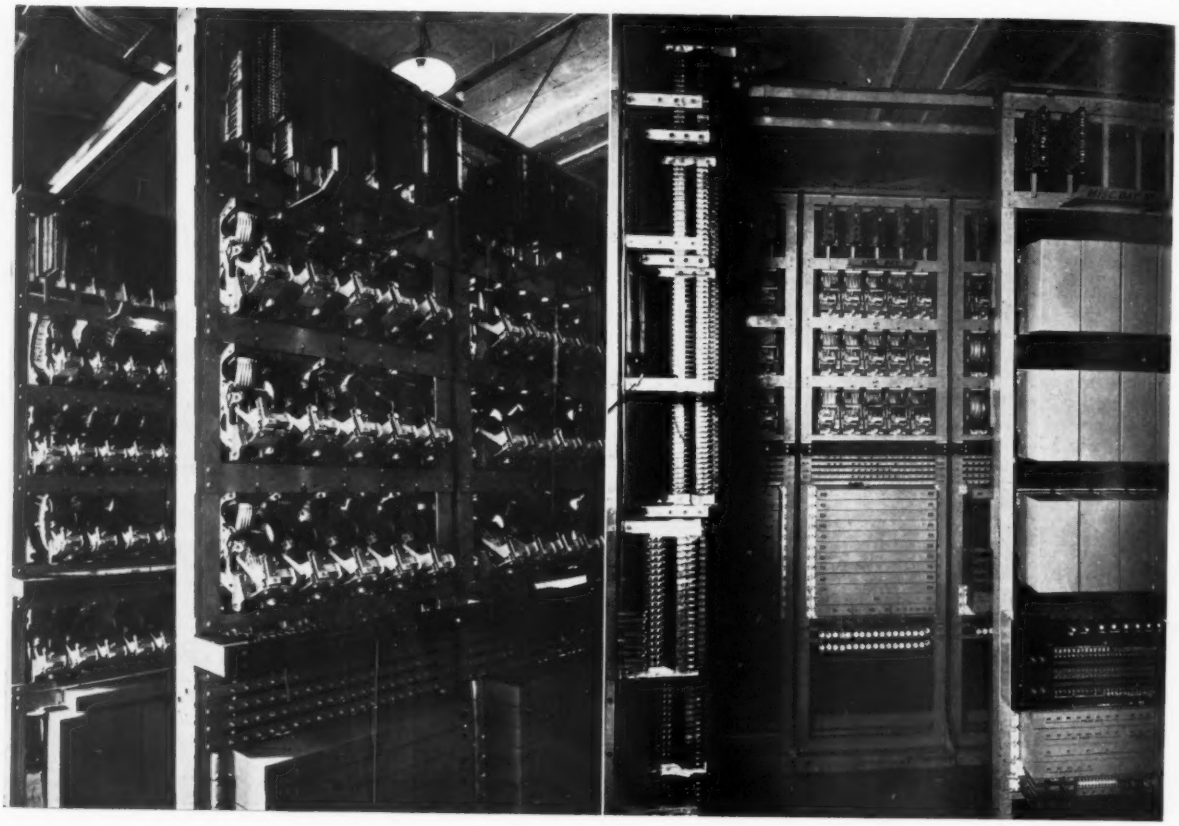
Superintendent, Southern Area, L.N.E.R., 1923-27

The late Mr. J. Strachan, C.M.G.,

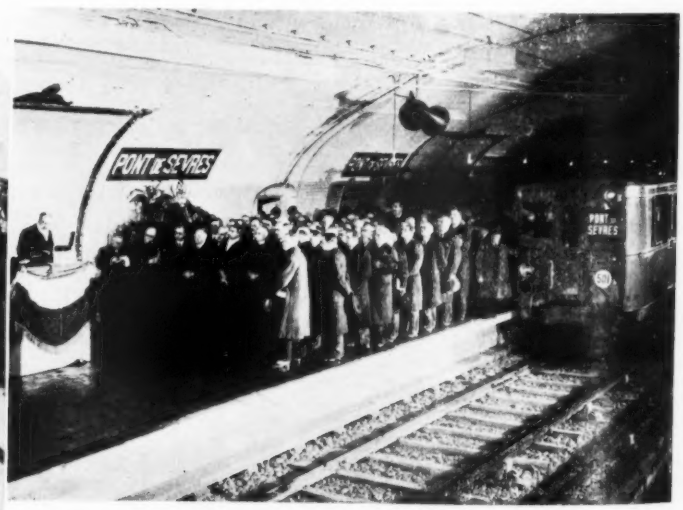
Director of Transport, Trinidad, and formerly General Manager and Chief Engineer, F.M.S. Railways

Mr. R. D. Walker, M.C.,

Appointed Manager and Chief Engineer, Kowloon-Canton Railway, British Section.



York headquarters offices, L.N.E.R., automatic telephone exchange, described on page 220. Left: Line and selector bays and Right: Part of line and miscellaneous bays and M.D.F.



The extension of the Paris Metro from Porte de Saint-Cloud to Pont de Sèvres, the first section to be carried beyond the old city boundary, was formally inaugurated on Saturday last. The view on the left shows the opening by M. Boutet, Director General of Railways and Roads, who represented M. Paganon, Minister of Public Works. Above is the platform level scene on the arrival of the first train (see article on page 221)

of Callender's Cable & Construction Co. Ltd., and of the Anchor Cable Co. Ltd.

Mr. Follett Holt, K.B.E., Chairman of the Buenos Ayres Great Southern and Buenos Ayres Western Railways, is sailing to-day for Buenos Aires, and expects to return some time in May.

Mr. S. J. Hungerford, Acting President of the Canadian National Railways since the resignation of the late Sir Henry Thornton, has been appointed President by the Trustee Board.

We regret to record the death on January 29 of Mr. W. B. Rawlinson, Joint Agent of the Southern and Great Western Railways in Jersey.

Mr. W. Greame Hendrey, Overseas Manager of Callender's Cable & Construction Co. Ltd., has been appointed Advisory Director to the company.

Major H. Noel Davies, O.B.E., Deputy General Manager of the Tanganyika Railways, has arrived home on leave pending retirement.

We note with regret the death on January 20 of Mr. J. H. Foot, late Accountant, Railway Clearing House, at the age of 73.

Dr. J. Donald Pollock has been appointed Chairman of the Board of Directors and Mr. P. B. Liversidge Chairman of the Management Committee of the British Oxygen Company.

Mr. R. J. Venn, M.I.Chem.E., late of the Dorr Oliver Company, has joined the Chemical Engineering Department of Davey, Paxman & Co. (Colchester) Ltd.

We regret to record the recent death of Mr. J. P. Crosbie, a Director of Hadfields Limited. He had been associated with the firm for over 40 years and an eminent Works Member of the Board since 1914.

We regret to record the death on January 23 of Mr. John Frame, the well-known travel agent. He founded Frames Tours Limited in the early eighties, which now has 230 offices or agencies throughout the world. He was 86 years of age.

At the usual meeting of the Committee of the Irish Railway Clearing House, held on January 31, Sir Walter Nugent, Bart., Chairman of the Great Southern Railways, and Director of the Bank of Ireland, was unanimously re-elected Chairman for the year 1934.

We learn with regret of the death at Montreal on January 23 of Major-General C. J. Armstrong, C.B., C.M.G., who was on the staff of the Director of Railways during the South African war and subsequently served as a Divisional Engineer, South African Railways. During the Great War he rose to be Chief Engineer, 7th Army Corps, being mentioned in despatches four times and awarded the C.M.G. and C.B. and several foreign orders.

Major J. A. Macdonald has been appointed a Director of the A.B.C. Coupler & Engineering Co. Ltd., in place of Mr. A. Wilson-Filmer and as alternate to Lord Queenborough.

Mr. W. H. Tyce has been appointed technical representative of Greenwood & Batley Limited, in South Wales. His address is 1, Kymin Terrace, Penarth, Glamorgan.

We regret to record the death of Mr. Walter Sandrey, for many years the popular hall porter of the Great Western Railway's Tregenna Castle Hotel at St. Ives, Cornwall, who was known to hundreds of visitors of that very popular hostelry as "Walter."

L.M.S.R. Appointments

The following appointments have been approved by the Directors:—

Chief Operating Manager's Department

Mr. W. M. Sangster, District Locomotive Superintendent's Assistant, Cricklewood, to be District Locomotive Superintendent, Peterborough.

Signal and Telegraph Engineer's Department

Mr. F. T. Scragg, District Signal and Telegraph Assistant, Stoke, to be District Signal and Telegraph Assistant, Warrington.

Mr. F. C. Dean, Chief Inspector, Stoke, to be District Signal and Telegraph Assistant, Stoke.

Nigerian Railway Appointments

Mr. L. A. Morrison has been appointed Chief Civil Engineer, Mr. E. J. Smith Chief Accountant, and Mr. J. E. McEwen Assistant General Manager, of the Nigerian Railway.

Indian Railway Staff Changes

Mr. E. M. Cory has been confirmed as Deputy Chief Engineer G.I.P. Railway, as from September 3.

Mr. J. Scruby has been appointed to officiate as Deputy Chief Engineer, N.W.R., as from November 21.

Mr. G. J. Eades has been appointed to officiate as Deputy Chief Engineer Signals, N.W.R., as from November 16.

Mr. E. C. J. Gahan, on return from leave, has assumed charge of the Commercial Department of the B.N. Railway.

Mr. F. R. Morgan, on return from leave, took over charge as Senior Government Inspector of Railways, Circle No. 4, Lahore, on November 14.

Mr. H. E. Presswell, Deputy Chief Operating Superintendent (E.I.R.), has been granted 22 months' leave prior to retirement, as from January 2.

Mr. A. Cooper, Deputy Chief Commercial Manager, N.W.R., has been granted leave for two months, as from January 1, 1934.

Mr. R. Shepton, Deputy Chief Engineer, G.I.P. Railway, has been granted leave for 5¼ months as from January 3.

Royal Engineers Transportation Units

Brevet-Colonel W. E. Blakey, M.M., R.E. (S.R.) (who in civil life is District Goods Manager, Middlesbrough, L.N.E.R.) presided at the seventh annual dinner of the Royal Engineers Transportation Units, which was held at the Abercorn Rooms, Liverpool Street Station Hotel, London, last Friday evening. Those present included:—

Mr. Anthony Armstrong, Mr. K. Brinsmead, Major-Gen. E. N. Broadbent, Col. W. E. Blakey, Lt.-Col. F. T. Bowler, Major H. P. M. Beames, Lt.-Col. R. Carpmael, Mr. R. G. Davidson, Major J. V. Denning, Mr. W. A. Dobson, Brig.-Gen. Sir Harold Hartley, Mr. J. A. Kay, Mr. J. F. Lean, Lt.-Col. F. A. Cortez Leigh, Lt.-Col. L. Manton, Mr. J. Miller, Major A. S. Quartermaine, Lt.-Gen. Sir Felix Ready, Major V. A. M. Robertson, Lt.-Col. H. A. Short, Col. Sir Josiah Stamp, Mr. W. A. Stanier, Major S. E. Tyrwhitt, Col. W. G. Tyrrell, Major R. Tandy, Col. Sir Herbert Walker, Mr. William Whitelaw, Lt.-Col. V. M. Barrington-Ward.

The Chairman (Brevet-Colonel Blakey), after the toast of "The King," proposed the only other toast of the evening, that of "The Guests." He said that this annual dinner gave them the opportunity of meeting the members of other units who took their annual training at Longmoor at different times during the summer. He welcomed the presence of so many distinguished representatives of the War Office and of the four British main-line railway companies.

Lieut.-General Sir Felix F. Ready, K.C.B., C.S.I., C.M.G., who first responded, spoke of the co-operation the War Office received from the British railway companies and expressed appreciation of the concessions granted both for duty and leave travel. Continuing, he traced the growing importance of railway transportation in war—first in the American Civil War, then in the Franco-Prussian War, and more recently in the Sudan, in South Africa, and the Great War, and referred particularly to the work of the transportation units in Palestine and Mesopotamia.

Mr. William Whitelaw, Chairman of the L.N.E.R., who followed, referred to the excellent work being done at Longmoor and related some of his experiences during the war period in Scotland. Continuing, he referred to the steadily improving position of the British railways and his belief that this country was leading the whole world back to sanity and prosperity.

Sir Josiah Stamp, Sir Harold Hartley, Sir Herbert Walker, Major General Broadbent, Colonel Tyrrell, and Mr. R. Carpmael also briefly responded.

New Automatic Telephone Exchange at York, L.N.E.R.

The first installation of the Bypath system in railway working; it permits of direct dialling to the G.P.O. system

(*See also illustrations on page* 218)

An automatic telephone installation of particular interest has just been brought into use at the headquarters offices of the L.N.E.R. (N.E. Area) at York, in replacement of the existing magneto exchange system and a large number of departmental telephone systems of various types. It also allows of more economical use being made of the Post Office telephone system, which was formerly independent of the company's system. Each of the larger offices had its own private branch exchange, but by arrangement with the Post Office Telephone Department all the Post Office lines to the company's offices are now connected to the new exchange. This permits a considerable economy in equipment and allows of 100 per cent. user of all available lines during the busy period of the day.

The new automatic exchange equipment, which has been manufactured by Standard Telephones & Cables Limited in the Hendon factory, is the first privately owned exchange to be installed operating on the Bypath system, although this system has already been installed in several public exchanges both large and small for the General Post Office. The Bypath is a new automatic telephone system and is the result of intensive development work on the part of manufacturers during the last five years. It is claimed that the Bypath has the following advantages over existing step-by-step systems:—Reduction in cost of initial equipment through simplification and reduction of equipment, with a consequent saving in weight and floor space; saving in junction plant and unification of equipment; saving in maintenance staff; and affording new and improved operating facilities.

The automatic equipment, which is for 310 lines with provision for further extensions if required, is situated in the basement of the headquarters offices, but the two-position manual board associated with it is, for convenience, situated in the telegraph office at the railway station. The exchange is composed of bays or units of equipment of the following types:—Line bays each with accommodation for 100 lines and 15 switches; selector bays each with accommodation for 10 connecting circuits and two bypaths; and miscellaneous bays, each accommodating 12 junction circuits, connecting the automatic exchange and the manual board. The fuse and supervisory panel, ringing generator and miscellaneous relays are also carried on one of the miscellaneous bays.

The particular features of the system are the type of switch used and the Bypath circuit principle. Single motion switches of one type only are employed throughout. These have 102 outlets on an arc of 180° and have been designed with special regard for easy maintenance. Selector mechanisms and banks are entirely interchangeable without any adjustments being necessary to align the wipers with the bank contacts. This interchangeability, an integral part of Bypath equipment, is the result of uniformity of apparatus throughout the system. Apart from the wired banks, which constitute the terminals for the bank multiples, all apparatus is of the jack-in type. The essence of the Bypath principle is that a minimum of equipment is held during the period of conversation. In common with all other machine switching systems, relays and switches are required to respond to impulses from the dial and to pilot the call through each successive stage between the originating and called lines. In the majority of systems the directive equipment is an integral part of each switching stage and is therefore held in enforced idle-

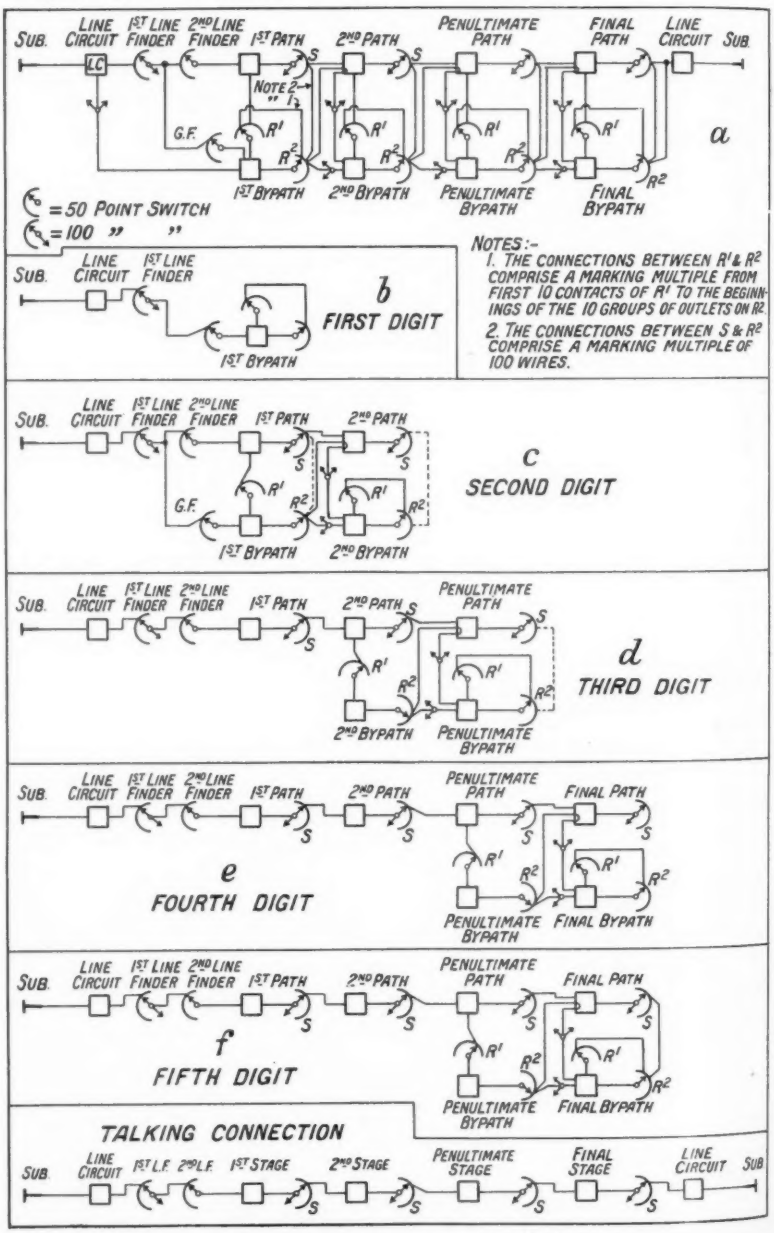


Diagram showing progress of call

ness, whilst the selector is engaged during conversation, whereas in this system the directive element (the By-path) is set free immediately it has positioned the selectors for conversation and is thus available for the control of another call. This arrangement permits of economy in the number of bypaths and simplifies the design of the circuits held during conversation.

The diagram reproduced shows the progress of a typical 5-digit call, (*a*) indicating all the relay groups and switches involved in the connection, and (*b*) the first bypath awaiting and receiving the first digit. The lifting of the subscriber's receiver energises his line circuit (LC) which operates the "start" circuit of a number of free 1st bypaths. The group finders (GF) of these bypaths hunt for a free 1st line finder in the group to which the calling subscriber belongs. A 1st line finder, when seized, is driven on to the calling line by the successful bypath, which then waits for the first digit. When this is received the R1 switch steps and the R2 switch drives to the point marked by R1; R2 hunts for a free 2nd-stage path, and when this is found the bypath switches through. The test lead is shown connected to the next path, and the impulsing leads to the next bypath. The distinction is necessary in the case of the test lead, since this must be opened when the path is busy, whilst the impulsing leads do not require to be broken, and can, therefore, be connected separately. R1 now hunts for a free path, and the 2nd line finder therein is driven on to the 1st line finder marked by the group finder. The path switch is then set on the 2nd-stage path marked by R2.

The condition of the circuit is now as shown in (*c*). The bypath connection for receiving the second digit is as shown, and is independent of whether the first path has been positioned or not. The second bypath receives the second digit, and its R1 switch then drives to the 2nd-stage path now marked by the 1st-stage path. The 1st-stage bypath is then released. The condition of the circuit is now as shown in (*d*). The impulsing circuit passes via the first and second paths and 2nd-stage bypath to the penultimate bypath which receives the third digit. R2 hunts for a free final path, and R1 drives to the penultimate path marked via the 2nd-stage path, whose bypath is then released.

The circuit is now as shown in (*e*). The penultimate bypath repeats the fourth and fifth digits to the final by-path, and holds until the required line is found and tested by the final stage. The final bypath receives the fourth digit on its R1 switch and drives the R2 switch to the corresponding point. This switch does not now hunt (since a particular line is required) but waits for the fifth digit, and steps in response to this digit to the contact corresponding to the subscriber required. The line is tested via the path switch. The banks of R2 which are used in other stages for testing outlets are here available for private branch exchange discrimination.

If the line be free, the penultimate path is signalled and the penultimate and final bypaths release, leaving the connection, as shown in (*f*), held by the penultimate path under control of the subscribers. If the line dialled is the first line of a private branch exchange group and is busy, R2 and the path switch stop in conjunction, the latter hunting for a free line in the group, while R2 controls it and ensures that the lines tested belong to the group. Release of the bypaths is delayed until the P.B.X. hunting is complete. The ringing of the called line, provision of busy tone, and the supervision of the call, are performed by the penultimate path.

Local calls on the exchange are made by simply lifting the receiver and dialling the wanted number. Subscribers on the public automatic exchange are obtained direct by dialling "9" followed by the public exchange number required. A considerable economy in time is made by this method of operating; it also relieves the operators at the manual board of the work of obtaining outward local calls and leaves them more free to deal with trunk calls and incoming calls from the public system. In order, however, to prevent an unnecessary number of Post Office calls being made, the facility of dialling public exchange calls directly is restricted to certain extensions. If "9" is dialled by a telephone not allowed the facility, the automatic exchange translates the number to "0" and the call is directed to the manual board, where an operator will deal with it and complete it at his discretion. It is not necessary for the local lines to be divided into groups for this purpose, a simple wiring change to any line circuit at the exchange being sufficient to bar direct out-dialling.

Incoming calls from the public system and all trunk calls are answered by an operator on the manual board, who ascertains the name of the wanted extension and extends the call to him over the automatic equipment. To obtain the attention of the operator for information, booking of trunk calls, &c., "0" is dialled. Provision is also made for recalling the operator by "flashing" on calls handled manually in order to effect transfers, &c. Calls to all branch exchanges in the York District are made by dialling direct, whilst calls to other exchanges on the L.N.E.R. are connected through the manual board and the company's trunks.

The telephones, which are of the moulded hand micro-telephone pattern, are of three types, namely, standard automatic, secretarial, and call-back. Secretarial phones are provided for officials on whose lines the majority of calls will be handled via their personal staff. Equipment on secretarial lines comprises two subsets, each fitted with a dial and with an incorporated means of signalling between them. Calls can be set up by either the official or by his staff and subsequently transferred in either direction. Local speaking between the official and his personal staff is possible without bringing into use any of the automatic equipment. The official can also cut his staff's subset from the line when desired. Call-back sets are equipped with two exchange lines and are provided with a key for switching from one line to the other. If during a conversation it is necessary to make an inquiry to another office the key is operated which switches the telephone on to the second line, at the same time holding the call.

The installation has been carried out jointly by the staff of the L.N.E.R. and the makers of the apparatus, to the directions of Mr. John Miller, B.Eng., LL.D., Engineer, and under the supervision of Mr. A. E. Tattersall, F.Inst.P., M.I.E.E., Signal and Telegraph Engineer (N.E. Area), Mr. C. C. Ellison having acted as Resident Engineer.

Paris Metro Extension to Pont de Sèvres

(*See illustrations on page* 218)

The extension of the Metro underground line No. 9 from Porte de Saint-Cloud to Pont de Sèvres was opened on Saturday last, February 3. M. Boutet, the Director General of Railways and Roads, represented M. Paganon, Minister of Public Works, who found it impossible to attend the ceremony because of a meeting of the Cabinet. The new line is the first section of the Metropolitan to be carried beyond the old city boundary, the now-demolished line of fortifications. After the Metro band had played the "Marseillaise," the official party travelled to the Pont de Sèvres, stopping at the two intermediate stations of Marcel Sembat and Billancourt. At the terminus, M. Laroze, President of the Metro, addressed the party and emphasised the advantages of the suburban extensions. In honour of the occasion, the porcelain factory at Sèvres unveiled a map of the line carried out in mosaics and affixed to the bridge across the Seine at Sèvres. Other suburban extensions of the Metro in course of construction include line No. 1 from Porte de Vincennes to Chateau de Vincennes and line 12 from the Porte de Versailles to Mairie d'Issy-les-Moulineaux. Completion of line No. 3 from the Porte de Champerret to Pont de Levallois-Perret will be delayed until the operating results of the first three suburban extensions are known.

[Numerous other extensions are planned; see map on page 643 of our issue of November 3.—ED. *R.G.*]

Some Aspects of Railway Development in Natal

In a paper bearing the above heading and published in the December issue of *The South African Journal of Economics*, Mr. W. J. Busschau deals at some length with the economic and other problems which preceded railway construction in the early days of Natal. In the initial stages, the problem confronting the promoters was to produce profits by a railway scheme developing resources, which were largely unknown, in a thinly populated country. It was essential to keep down the cost of railways to the very lowest amount consistent with the regular and economical conduct of traffic. The choice lay between small initial capital and high operating costs, and high initial outlay and low operating costs. The problem was complicated by the fact of the natural difficulty presented by the very broken, rugged and mountainous features of the country. Railway construction in South Africa generally, the author observes, has been very difficult, in that lines from the coast to inland centres have had to cross the series of terraces in the geological formation. In Natal this formation is pronounced, and it has meant that railways have had to be built with steep gradients and sharp curves. The alternatives are expensive engineering works and difficult lines. In either case the result is costly transport charges. On the other hand, climatic conditions, irregular rainfall and the prevalence of thunderstorms, combined with poor soils, required the construction of a substantial permanent way.

Railway construction began with the Durban-Point railway—the first railway opened in South Africa on June 26, 1860, and built to the 4 ft. 8½ in. gauge. The company was soon in difficulties owing to inadequate resources. Matters, however, improved, but its success, until 1872, was but meagre; thereafter it steadily made fair profits. As a developmental factor the Durban-Point line, by itself, was unimportant, since it represented nothing more than facilitation of handling goods at the Point. It was only when it became part of the main line in 1877 that it assumed importance in the economic development of the country. Serious proposals for extensive railway schemes began in 1863. From 1844 to 1863, the public revenue of the colony had shown an average increase of 30 per cent. per annum, while the average increase of the total of imports and exports over the same period gave a similar figure. Estimates of the population in 1862 gave Europeans as 17,000 and total population as 171,000, as compared with 8,000 and 121,000 in 1852. This progress led to a spirit of optimism and the appearance of ambitious railway projects.

After recounting the difficulties which confronted the Colonial Government when considering the demands of the early railway promoters, some of whom asked for a monopoly of mining, the author remarks that negotiations finally broke down in December, 1874, when Lord Carnarvon for the Home Government announced that he would submit a scheme for Government railways. The British Government was naturally anxious to protect the colony from exploitation by private companies, but the Natal Government's finances were so slender that it could not finance any very extensive railway system. Law 4 of 1875 then launched the Natal Government Railways, and expansion rapidly proceeded.

The capital was raised by the issue of loans on the London market. The Point railway was purchased from the Natal Railway Company, and the relaying of its rails on a narrower gauge was proceeded with. It was essential to have a low capital outlay and hence the narrow gauge of 3 ft. 6 in. (instead of the 4 ft. 8½ in. employed on the Point line) was adopted. The introduction of the narrower gauge brought with it certain disadvantages; the diminished width and lighter nature of the permanent way would give a direct saving in earth-works, bridges, tunnels, &c., but obviously this would be a temporary saving only.

"Then, too" (comments the author), "the tendency has been to increase the size of rolling-stock, and so with increased carrying capacity to obtain a greater paying load in proportion to dead weight hauled. The narrow gauge limits the increase in the size of the truck, and thus saving cannot be effected to any great extent. With narrow gauges, too, operating costs may increase, since the smaller the trucks, the greater will be the number of units required to move the traffic, and this will involve (*a*) more shunting, (*b*) more empty haulage, and (*c*) more siding accommodation. These defects would be apparent only in actual operation, and as the limits of carrying were reached they would increase. Actually, of course, the electrification of a section of the Natal line, and the doubling of portions, are attempts to overcome these defects. The colony, however, had no option but to promote narrow gauge railways, since it could not afford more substantial equipment."

Road transport on the Durban-Maritzburg section caused the railway administration much concern in these early years. Ox-wagon competition could not be shaken off, and it persisted until 1886, when it was diverted by the Rand route. The transport riders not being obliged to charge fixed rates could, in certain cases, give quotations, which brought them the traffic. On the north coast, for example, the wagon rate per ton of sugar cane was 15s. as against 13s. 3d. per ton by rail, but wagon owners often obtained the traffic by tendering for whole crops at rates below those of the railways. The figures show that by 1884, *i.e.*, four years after the opening of the Durban-Maritzburg section, one-quarter of the whole goods traffic still went by road. The railways had come to command the major portion of the traffic, but the competition of the ox-wagon owners, who had flourished since the opening of the diamond fields, was by no means negligible. The large volume of traffic consisted of agricultural products—wool, maize, potatoes, &c.—and the farmer could satisfactorily convey these products to the ports and markets in his own ox-wagon.

"Difficulty was encountered only when drought affected the grass lands, and so made transport by ox-wagon difficult. In years of drought (adds the author, quoting from D. M. Goodfellow's "A Modern Economic History of South Africa"), traffic may go to the railway, but then the traffic itself was likely to be small. There would be a distinct danger that, since they (the farmers) had in any case to maintain their draught animals and wagons, and since the distance to the port may be only slightly greater than the distance to the railway line, they may save the railway fares altogether."

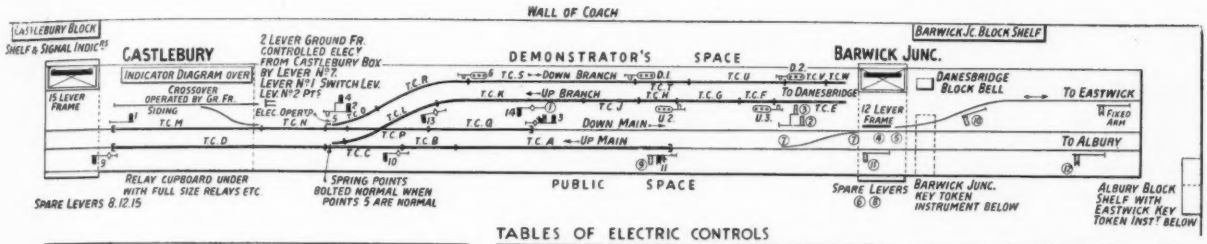
Mr. Busschau makes some interesting remarks on the subject of South African railway rates, and in concluding his paper says:—

"Advocates of State management allege that one of the advantages of a State system of railways is that it ensures the railways' operations in the general interest, and hence, that State railway rates will be lower than those of private companies. The evidence to prove or disprove the latter part of the contention does not exist, but the granting of preferential rates . . . is surely contrary to the general interest. Such a process represents nothing more than a diversion of wealth from those paying ordinary rates to those receiving preferential treatment in a manner without justification, economic or ethical.

"A second advantage often advanced in favour of State railways is that the profits accrue to the State. This, though, may be anything but an advantage to the community. The Natal Government made large profits on its railways, and these sums going to the general revenue, amounted to taxation—a taxation of a discriminating nature. The public interest is best served by low rates, and the employment of a railway as an instrument of taxation defeats that object.

"While, then, the Natal Government Railways as a business concern was profitable, the measure of its success in giving service to the community was not so great. There did exist a need for the better policy (whatever has been its practical application), which was intended in the Act of Union. Actually, too, political considerations between the different States complicated railway working considerably, and in a very real sense the political union was the result of a movement towards the amalgamation of the South African Railways."

Signal Demonstration Van, L.N.E.R. (See editorial note on page 201)



TABLES OF ELECTRIC CONTROLS

CASTLEBURY

DESCRIPTION	CONTROLLED BY
SIGNAL N°1	T.C's M.N. & 2.4 ARMS & LEVERS NORMAL
" " 2	T.C's L.O.P.Q. & 3 ARM & LEVER NORMAL
" " 3	'LINE CLEAR FROM BOX AHEAD (EFFECT FOR 1 REL' ONLY)
" " 4	T.C's O.P.R. & 6 AT RED OR 6 CONTROLS TO YELLOW CLEAR
POINTS N°5 (NOR. & REV.)	T.C's L.O.P. (N. AUTO. TIME RELAY)
SIGNAL N°6 (LEVER & Y ASP')	T.C's S.T. & AUTO. D1. AT RED OR D1. CONTROLS TO YEL" CLEAR
" N°6 G. ASPECT (AUT)	T.C. S. & AUTO. D1. AT YELLOW OR GREEN
" N°10	T.C's. C.D.L.
" N°11 (ARM)	T.C. B. & 9.10. & ⑨ ARMS OFF.
" N°13	T.C's. C.D.L.P.
UP MAIN BLOCK	T.C's. B.C.D. & 10.11 ARMS. 10 LEVER NORMAL

ELECTRIC INDICATORS
TRACK CIRCUITS. A.B.C.D.(E.F.)(F.G.H.)(H.J.)K.L.M.N.O.P.Q.R. (S.T.)
SIGNALS (2.4.) 3.10.11.13.14. COLOUR LIGHTS 6. U2 POINTS 5

COLOUR LIGHT AUTOMATICS

DESCRIPTION	CONTROLLED BY
D1 YELLOW ASPECT	T.C's T.U.V. & D2 AT RED & LAMP BURNING OR D2 CONTROLS TO YCLEAR
D1 GREEN "	T.C's T.U. & D2 AT YELLOW OR GREEN
D2 YELLOW "	T.C's V.W. ETC. (CONTROLLED BY SWITCH)
D2 GREEN "	" " " " " " " "
U3 YELLOW "	T.C's F.G.H. & U2 AT RED & LAMP BURNING OR U2 CONTROLS TO YCLEAR
U3 GREEN "	T.C's. F.G. & U2. AT YELLOW OR GREEN
U2 YELLOW "	T.C's H.J.K. & 13.14 ARMS. 13 LEVER HAVING BEEN REPLACED
U2 GREEN "	T.C's H.J.K. & 9.13.14 ARMS OFF

BARWICK JUNC.

DESCRIPTION	CONTROLLED BY
SIGNAL N°3	KEY TOKEN TO EASTWICK
	(EFFECTIVE FOR 1 RELEASE ONLY)
" " 9	T.C's. A.B.C.D.L.
" " 10 & 11	9 LEVER NORMAL (MECH)
DOWN MAIN BLOCK	1 ARM ETC 2 3 LEVERS NORMAL
UP " "	12 ARM 11 LEVER NORMAL

ELECTRIC INDICATORS
TRACK CIRCUITS (A.B.C.D.L.) SIGNALS 1 12.

MECHANICAL DETECTION

		DETECTS POINTS NORMAL	DETECTS POINTS REVERSED	DETECTS F PLs
CASTLEBURY	SIGNAL 2	5	-	5
"	" 4	-	5	5
BARWICK JC.	" 2	5	-	4
" "	" 3	-	5	4
" "	" 10	-	7	4

TABLE OF MECHANICAL LOCKING
CASTLEBURY

RELEASED BY	N°	LOCKS
2.4. NOR. (ELEC.)	1	7 5⁹/₁₆
3 NOR. (ELEC.)	2	5 7⁹/₁₆
	3	
5	4	7⁹/₁₆
	5	2
	6	
	7	1
	8	SPARE
	9	
	10	13.14.
10.9.	11	
	12	SPARE
5	13	10
5	14	10
	15	SPARE

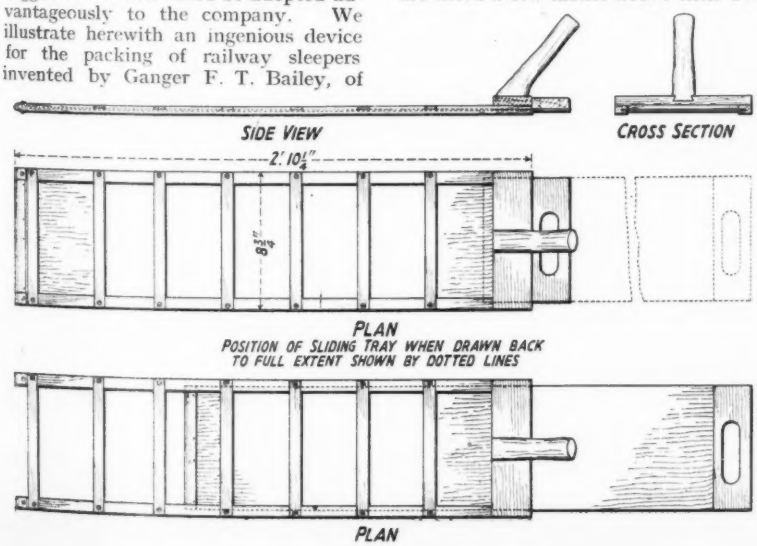
TABLE OF MECHANICAL LOCKING
BARWICK JC.

RELEASED BY	N°	LOCKS
2	1	
4	2	5 7
5.4	3	7
	4	(5 7⁹/₁₆)
	5	2
	6	SPARE
	7	2 3 11
	8	SPARE
	9	(7⁹/₁₆)
(9 NOR) 7.5.4	10	
(9 NOR)	11	7
9.11.	12	

To the description of the mobile signalling school of the L.N.E.R., which appeared on page 26, and was illustrated on page 19, of our issue of January 5, we are now enabled, by the courtesy of Mr. F. Downes, Signal and Telegraph Engineer, Southern Area, L.N.E.R., to add the accompanying reproduction of a diagram of the layout of the model railway and of the signalling. This also gives the designation of the levers, particulars of the interlocking, and of the electrical controls

Fly Packing Permanent Way

In our issue of October 6 last we mentioned that the Southern Railway had lately developed a scheme for rewarding those members of its non-administrative staff who put forward suggestions which could be adopted advantageously to the company. We illustrate herewith an ingenious device for the packing of railway sleepers invented by Ganger F. T. Bailey, of Nine Elms. The Southern Railway generally use the method known as fly packing, or shovel packing, for permanent way maintenance. By this method sleepers which require packing are lifted a few inches above their beds by means of a jack or a lever, and a quantity of fine ballast is sprinkled beneath them under the rail. The amount necessary is a matter for the judgment of the packer, who with practice becomes highly expert. When the rail is dropped again and one or two trains have passed over, if the amount added has been correctly judged and correctly placed, the level of the track will have been properly adjusted. In order to place the fine ballast under the raised sleeper, it has hitherto been necessary to clear the original ballast away from the side of the sleeper to make room for placing the shovel horizontally underneath. By Ganger Bailey's device this may be obviated, and only the ballast at the end of the sleeper need be moved. The device can then be inserted from the end of the sleeper and the fine ballast deposited exactly where it is required underneath, such compartments as necessary being loaded with chippings previously. The slide is then withdrawn, allowing the chippings to fall on the sleeper bed, when the whole apparatus is removed and the sleeper dropped once more. We are indebted to Mr. George Ellson, Chief Engineer of the Southern Railway, for the drawing reproduced.



RAILWAY AND OTHER MEETINGS

MIDLAND RAILWAY COMPANY OF WESTERN AUSTRALIA LTD.

The ordinary general meeting of the Midland Railway Company of Western Australia Limited was held on Thursday, February 1, at Winchester House, Old Broad Street, E.C., Sir George Touche, Bart. (Chairman of the company), presiding.

The Secretary (Mr. William Tait) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said they covered a year in which the economic conditions in Australia had continued to feel the effect of the unprofitable prices for export commodities. Their gross traffics had amounted to £156,705, or a decrease of only £533 compared with 1932. Despite the difficult conditions, the traffic returns had been fairly well maintained. Net receipts had amounted to £82,457, an increase of £592 as compared with 1932. The net revenue for the year showed a balance of £75,347 compared with £78,758, a decrease of £3,411. That was due largely to a decline in the amount received in respect of interest and to an increase in the amount charged for loss on exchange on remittances from Australia to London. The Board had transferred a sum of £5,000 to the exchange contingency account so as to increase the reserve created for the purpose of providing as far as possible for depreciation of the floating assets in Australia.

For some years prior to 1931 the amount set aside for the purpose of depreciation and renewals was no more than what was required to cover the actual expenditure on renewals. During the worst period of depression and uncertainty it was a disagreeable necessity to keep expenditure on repairs and renewals as low as possible.

It was manifest that, sooner or later, a greater outlay would be necessary if their railway was to be preserved in a condition of efficiency and safety. That matter had been receiving a searching attention, and the Board had under consideration plans made by Mr. Poynton. In those circumstances, a sum of £30,000 had been transferred for that purpose. That allocation and £29,618 for interest on the Second Mortgage Cumulative Income Debenture stock at the full rate of 5 per cent. left a balance of £16,358 to be carried forward.

He did not suppose any Unified Ordinary stockholder could have expected a dividend. Considering the severity of Australia's crisis, they had reason to congratulate themselves that things were as good as they were. It had been an achievement of which all concerned in the local administration might be proud. The position of land sales naturally showed no improvement. The low prices of primary products had made the lot of settlers very difficult, and the area which had reverted to the company during the year had exceeded sales by 12,443 acres.

Turning to the situation of Australia as a whole, the year had finished on a more promising note than that on which it had begun. Australia had been able to weather the storm because it was a country of great natural wealth. Wool and wheat, especially wool, had furnished the major portion of the means of recovery. There had been a gratifying rise in the price of wool during the past eight months, and the prospects of better prices were more hopeful than for some years past.

Reviewing the situation in all its aspects, he thought they could look forward with a chastened confidence to the future, but it would be a mistake to expect too much. Australia had not only proved itself to be a country of great natural resources, but had shown its Governments and people to be possessed of that fortitude which was capable of meeting and overcoming a crisis; they had set an example to other nations.

The report and accounts were unanimously adopted.

PULLMAN CAR CO. LTD.

The ordinary general meeting of the shareholders of the Pullman Car Co. Ltd. was held on Monday, February 5, at Victoria station, S.W.1, Mr. Follett Holt, K.B.E. (Chairman and Managing Director), presiding.

The Secretary (Mr. E. A. Ashton) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that since the last meeting the company had passed through another difficult year, but it would be seen from the report and accounts that the progressive fall in receipts suffered for some years had at last been arrested, and an actual increase of some £10,000 was shown. Shareholders would have seen also that traffic to the Channel *en route* to the Continent, the decline in which had been the main cause of their troubles, showed a slight improvement, although the figures remained at a low ebb. On the other hand, they had to face during the year the additional expense of running for nine months the new cars for the Brighton electric service and to bear the increased interest charges on their cost. The increase in these costs affected the results, but it must be remembered that the Brighton service was new and not in its full stride, and he thought they could reasonably look forward to better results from it in the second year of its working.

He had explained before how the railway crisis which produced such heavy losses in traffic had thrown the company into serious difficulties on the cash side. At one time, only five years ago, the company owed to the noteholders, to its bankers, and for quotas due on rolling stock no less than £232,000. As during the period of collapsing receipts they did not know to what low point revenue might fall, the only way to deal with this peril of indebtedness and so ensure the safety of the company was to use all resources to reduce indebtedness; it would be seen that this now stood at the manageable total of £82,000. As the accounts of the past year showed that receipts had ceased to fall and were again on the up grade, the directors felt that they could now safely issue debentures to pay off this remaining short term indebtedness and so pave the way towards the payment of dividends.

On account of national sentiment certain difficulties were experienced in the operation of the four cars running on the Great Southern Railways of Ireland, and it was found advisable to form a subsidiary company in Dublin to take over those cars as from October 1, and that action had served to smooth the path in the Irish Free State.

Referring to the termination of the contract for Pullman services in Scotland, which was entered into in 1914, the Chairman added that in Scotland the position was not the same as in England, for no supplements were charged, and revenue came from the restaurant side only. Although the public was well satisfied with the service and cars, when the subject of the renewal of the contract arose last year the officials of the London Midland & Scottish Railway said definitely, for some inexplicable reason, that they preferred their own dining cars and service to the company's, and that the latter could remove its cars from the Northern Division. If the Pullman Car Company could find no other services for them the L.M.S.R. was prepared to buy them, not at a price that had any relation to their cost to the company, but one based on the price at which the railway officials said they could build cars of a similar type. The directors could only observe these statements of cost as they had no means of putting them to the test, and finally had no alternative but to accept the price offered by this powerful corporation, namely, £21,000. These 22 cars, after allowing for depreciation at a normal rate, represented a value to the company in its books of £152,000, the difference representing a loss of £131,000. That capital loss had unfortunately to be replaced either by accumulating revenue, which would mean that no dividends could be paid until the loss had been made good, or by a reduction of the capital of the company—in other words, by reducing the nominal value of the shares. But the position did not end with these Scottish cars. In England there were a number of cars that, in order to carry on the business, were purchased some 12 years ago, during the post-war time when values were much inflated, and these stood in the books at values

beyond their present earning power and beyond the value at which they could be replaced to-day. That position required to be faced also, and the directors were having a searching examination made of the first cost of all the cars and of their expected life and replacement value, and when that was completed and the figures closely examined and reported upon by the company's auditors, they should suggest to shareholders a scheme of capital reduction which would bring the capital into line with the value of the assets as they were known to be to-day. He hoped it would not be long before they were able to submit a scheme, one acceptable to the preference and the ordinary shareholders, so that the company would again be in a position to resume, as revenue allowed, the distribution of dividends, modest as they might be; more must not be expected until England regained some part of her old prosperity. As a matter of fact, shareholders would be interested to know that this year, in spite of the loss of revenue from the Scottish cars, receipts were holding their own, and he hoped would continue to improve.

He would not close without expressing the Board's indebtedness for the earnest work of Mr. Griffith, the General Manager, of Mr. Ashton, the Secretary, and the staff in the company's interests.

The report and accounts were unanimously adopted.

RAILWAY AND OTHER REPORTS

London Midland & Scottish Railway.—The Secretary writes, February 7:—"For the year 1933, the company's railway receipts decreased by £322,000 and receipts from all sources decreased by £326,000. Reductions in working expenses amounted to £1,134,000, making a net increase of £808,000, the net revenue being £10,713,000. The provisions for renewals have been made on the same basis and the charge for rates upon the same lines as in previous years, and in addition £140,000 has been charged to working expenses in respect of certain deferred repairs of rolling stock which will be overtaken in the early part of 1934. At the meeting of the Board to-day it was decided to pay the following final dividends:—£2 per cent. on the 4 per cent. guaranteed stock, making with the interim dividend of £2 per cent., £4 per cent. for the year; £2 10s. per cent. on the 4 per cent. preference stock, making with the interim dividend of £1 per cent., £3 10s. per cent. for the year; £3 2s. 6d. per cent. on the 5 per cent. redeemable preference stock (1955) making with the interim dividend of £1 5s. per cent., £4 7s. 6d. per cent. for the year; carrying forward £59,654 and making no payment on the 4 per cent. preference stock (1923) and the ordinary stock. The warrants in respect of these dividends will be posted on February 27."

Oldham, Ashton-under-Lyne and Guide Bridge Junction Railway.—The report for 1933 shows gross railway receipts £20,041, against £21,453 in 1932, and expenditure £26,750 against £27,293, leaving a loss on working of £6,700 against £5,840. Adding miscellaneous receipts and deducting charges leaves the year's debit on revenue account £5,185, against £4,148.

Tilling & British Automobile Traction Limited.—Revenue for 1933 was £263,336, against £272,483, and the net profit £235,264 against £234,801. On July 1 last the company's London omnibus undertaking was transferred to the London Passenger Transport Board, and in consequence the accounts include the profits of that undertaking only for the first six months of the year. The ordinary dividend is maintained at 10 per cent., and the amount placed to reserve is again £10,000. During the year the sum of £400,000 was capitalised and there was a capital bonus of 25 per cent. for ordinary shareholders. The main business is that of a holding company, in which capacity it shares with the appropriate main-line railways in the control of a large number of provincial omnibus undertakings.

New South African Locomotives

(From our South African correspondent)

Parliamentary sanction is being sought for the expenditure of £600,000 for new rolling stock, and included in this is an order for 50 new engines of the 19C class, to cost altogether about £350,000. It is expected that tenders* will be called for as soon as this expenditure has been approved by Parliament. With the improvement of traffic evidenced lately, it is felt that the present conditions are favourable for definite steps to be taken to enable the Administration to place its rolling-stock resources in a position adequately to cater for the needs of the future. The new engines will to a great extent replace the old 8-class engines and will be utilised for the most part on branch lines. There is, indeed, great need for more engine power at present, and the arrival of the new engines will do much to relieve the heavy demand for engine power anticipated as likely to start in the middle of May, when the Natal sugar-cane season begins, and in the following month, when there are likely to be heavy movements of maize to the port elevators. The 19C class is of the 4-8-2 type, being a modification of the existing 19B class and suitable for light general duties. The following are the leading dimensions specified:—

Gauge	... ...	3 ft. 6 in.
Wheel arrangement	...	4-8-2.
Cylinders (2), diam.	...	21 in.
,, stroke	...	26 ,,
Coupled wheels diam.	...	4 ft. 6 in.
Boiler pressure	... ...	200 lb. per sq. in.
Heating surface—		
Tubes	... ...	1,700 sq. ft.
Firebox	... ...	130 ,,
Total evaporative	...	1,830 ,,
Superheater	... ...	464 ,,
Total	... ...	2,294 ,,
Grate area, approx.	...	36 sq. ft.
Maximum axle load	...	13 tons.
Weight of engine in working order, approx.	...	80 ,,
Weight of tender in working order, approx.	...	67 ,,

A superheater of the M.L.S. type with multiple valve throttle is to be fitted. The grate will be fed by mechanical stoker. The tender is to be mounted on two four-wheeled bogies and will carry 12 tons of coal and 6,000 imperial gallons of water. At 75 per cent. of the boiler pressure the locomotive will develop a tractive effort of 31,850 lb.

* The call for tenders for these locomotives was referred to in the News Columns of our issue of January 26 and in the Contracts and Tenders sections of the issues of January 26 and February 2.—[ED. *R.G.*]

Forthcoming Meetings

Feb. 23 (*Fri.*). **London Midland & Scottish Railway Company** (Ordinary General), Friends House, Euston Road, N.W., at 11.30 a.m.

Forthcoming Events

Feb. 10 (*Sat.*).—Permanent Way Institution (Manchester and Liverpool), at Victoria Station, Manchester, 3 p.m. "Gas Lighting, Heating and Water Services," by Mr. J. Coombes.

Feb. 12 (*Mon.*).—Institute of Transport (London), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 5.30 p.m. "Regeneration as Applied to Electric Traction," by Mr. G. F. Sinclair.

North-Western Polytechnic, Prince of Wales Road, London, N.W.5, 7.30 p.m. "The Road and Rail Traffic Act, 1933," by Mr. F. G. Bristow, C.B.E.

L.M.S.R. Opening of New Offices, at Euston House, Seymour Street, London, N.W.1, by Mr. Oliver Stanley, Minister of Transport, 4 p.m.

Feb. 14 (*Wed.*).—Institution of Heating and Ventilating Engineers, 12, Russell Square, London, W.C.1, 10.15 a.m., Council Meeting. 2 p.m., Annual General Meeting. 6.30 for 7 p.m., Annual Dinner, at Hotel Russell, Russell Square.

Institution of Railway Signal Engineers, at Inst. of Electrical Engineers, Savoy Place, London, W.C.2, 6 p.m. Annual General Meeting and Presidential Address.

Permanent Way Institution (London), in Staff Dining Room, Waterloo Station (S.R.), 7 p.m. "Railway Maintenance as Practised by the L.N.E.R. in Scotland," by Mr. J. C. L. Train.

Feb. 16 (*Fri.*).—Institute of Transport (London), at Connaught Rooms, Great Queen Street, W.C.2, 6.30 for 7 p.m. Annual Dinner.

Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 5.30 p.m. Annual General Meeting.

Railway Students' Association (Edinburgh), at Goold Hall, St. Andrew Square, 7.30 p.m. "Gravitation Yards—with Special Reference to Whitemoor Yards," by Mr. H. H. Mauldin.

NOTES AND NEWS

Kent Collieries' Record Output.—During 1933 the Southern Railway carried over 1,700,000 tons of coal from the Kent collieries, an increase of over 150,000 tons on the previous year.

Queen's Hotel, Leeds.—Now that the many difficulties in connection with the rebuilding of the Queen's Hotel, Leeds, and the station front have been cleared up, the Directors of the L.M.S.R. have given instructions for the preparation of detailed plans with a view to the work being proceeded with early in the spring.

Arm-Rests on the L.N.E.R.—The L.N.E.R. has decided to adopt as a standard on all new corridor carriages arm-rests for third- as well as first-class passengers. Arm-rests are also to be fitted in the carriages of L.N.E.R. trains now running between King's Cross, Aberdeen, Glasgow and Perth, Aberdeen and Penzance, and between Edinburgh and Plymouth.

G.W.R. Diesel Railcar Resumes Service.—The A.E.C. streamlined diesel-engined railcar, which was withdrawn in December last for modifications to the braking system, resumed service on the G.W.R. on Monday last. It is working, as formerly, between Southall, Slough, Reading, and Didcot, but on a slightly faster schedule than originally proposed. The car is now fitted with automatic train control apparatus.

London Transport Acquisitions.—During the past month the London Passenger Transport Board has taken over eight vehicles and the London–Aylesbury and London–Chesham coach services of West London Coaches (on January 17); 13 vehicles and the London–Brentwood service of Sunset Pullman Coaches (on January 25); and 24 vehicles and the London–Luton service of Strawhatter Coaches (on February 1).

Honour for "Royal Scot" Driver.—On Monday, at Euston, the Rt. Hon. J. H. Thomas, Secretary for the Dominions, presented, on behalf of the King, the British Empire Medal to Driver William Gilbertson, of Carlisle, in recognition of his services in connection with the "Royal Scot" American tour. The ceremony took place prior to the departure of the Royal Scot, hauled for the first time since its return from Canada, by locomotive No. 6100 *Royal Scot*, and manned by Driver Gilbertson and Fireman J. Jackson. The latter, together with Fitter W. C. Woods (Crewe) and Fireman Tom Blackett (Carlisle), were presented to Mr. Thomas by Sir Josiah Stamp, Chairman of the L.M.S., who was supported by Sir Harold Hartley (Vice-President), Mr. O. Glynne Roberts (Secretary), Mr. C. R. Byrom (Chief Operating Manager), Mr. W. A. Stanier (Chief Mechanical Engineer), Mr. G. H. Loftus Allen (Advertising and Publicity Officer), and other L.M.S. officers. Messrs. C. O. D. Anderson and T. C. Byrom, who were in charge of the Royal Scot train during the North American tour, were also present.

King's Cross Station Alterations.—The L.N.E.R. has decided to convert platforms Nos. 3 and 4 at King's Cross station into one long platform in order to improve the facilities for the reception and departure of long-distance express passenger trains. Improvements to the frontage of the station, now nearing completion, include the replacement of wooden buildings by substantial single-storey shops, and the erection of a pleasing permanent hoarding for railway announcements.

Welwyn Viaduct.—Repairs are being carried out on the famous Welwyn viaduct which carries the L.N.E.R. main line to the North. The viaduct is a red brick structure of 40 spans of 30 ft. each and a maximum height of over 90 ft. from ground to rail level. 4,000 sq. yd. of arches and 17,000 sq. yd. of the piers are being refaced, much of the work being carried out on scaffolding at a considerable height above the ground. The work, which was commenced in 1930, is estimated to take five years to complete.

Railway Conciliation Machinery.—Representatives of the four group railways and of the three railway unions met yesterday (Thursday) to consider the question of conciliation machinery for the settlement of disputes in place of the present procedure before the National Wages Board. The proposals of the companies were formally communicated to the union representatives. It is understood that they wish to have the duties of the National Wages Board confined to major issues, that it be reduced in size, that direct representatives of the companies and their employees should not vote at the hearings, though they might possibly sit as assessors, and that the proceedings should be held in private.

Clyde Paddle Steamer.—William Denny & Bros. Ltd., Dumbarton, launched on February 1 the paddle steamer *Caledonia* for the L.M.S.R., the naming ceremony being performed by Mrs. Harris, wife of Captain J. W. Harris, L.M.S. chief marine superintendent. The *Caledonia* is 222 ft. in length, and is designed for service on the Clyde. Like the *Mercury*, launched a few weeks ago for the same service by the Fairfield Shipbuilding & Engineering Company, the vessel has a cruiser stern, a single funnel, and two masts. She will carry about 1,300 passengers. A deck shelter or observation room for first-class passengers is on the promenade deck aft, a similar shelter being located on the same deck forward for third-class passengers. The vessel will be propelled by a three-crank, triple-expansion, diagonal, surface-condensing engine running at 55 r.p.m. Steam will be supplied by two cylindrical Navy-type, two-furnace boilers, of 200 lb. per sq. in. working pressure, burning coal and operating under closed-stokehold forced draught.

Russian Electrification.—Reuters Trade Service reports that preliminary work on the electrification of the 188-mile Murmansk-Kandalaksha line has been in progress for some time. It is anticipated that the Kandalaksha-Apatity-Khibinogorsk section will be electrified and opened for traffic in May.

P.L.M. Railway Posters.—Copies of three finely-coloured posters issued by the Paris, Lyons & Mediterranean Railway are just to hand from the London Office, 179, Piccadilly. They depict, and that very charmingly, the sunshine joys of the Côte d'Azur, summer and winter sports at Chamonix, and the scenic attractions of the island of Corsica.

Sixty-six New Factories on the G.W.R.—During last year 66 new factories were established on the G.W.R. system, making 140 since September, 1931, when Britain went off the gold standard. Altogether, over 350 applications for factories and factory sites were received during 1933. Some 90 per cent. of these were for accommodation in the London area, preferably in the western suburbs, and this has led to the great development of the model industrial estates:—the Great Western trading estate, Park Royal; the Chase estate, Park Royal; the Perivale industrial centre, Greenford; and the Slough trading estate, Slough.

Names for New Locomotives on Northern Counties Section, L.M.S.R.—Three of the four 2-6-0 mixed traffic locomotives, recently built at Derby for the Northern Counties Committee Section, are to be named after rivers in Northern Ireland, as follow: No. 91 *The Bush*, No. 92 *The Bann* and No. 93 *The Foyle*. The first engine (No. 90) and the class as a whole are known as the "Duke of Abercorn" class after the Governor of Northern Ireland, who recently performed the opening ceremony of the new Greenisland Loop Line over which the new locomotives will be used to provide accelerated services between Belfast and Portrush and Londonderry.

Typists on Trains.—The L.N.E.R. has announced a new facility for its passengers, namely, that trained typists and a fully-equipped office will be provided so that letters may be dictated, correspondence dealt with, documents typewritten, communications posted, &c., *en route*. It is proposed to give this service on the 5.30 p.m. express from King's Cross to Newcastle, and on the 8.15 a.m. express from Newcastle-on-Tyne to King's Cross, beginning with the former next Monday. The 268-mile journey by each of these trains

is covered in just over five hours. As recalled in our Scrap Heap column this week, the old L.N.W.R. introduced typing services on trains as long ago as 1910. The special feature of the present innovation is that a dictating compartment, equipped with Dictaphone apparatus, will be set aside in addition to the business office. Passengers will be able to dictate at convenience and be assured of the work being completed by the end of the journey. Direct dictation involves possible delay and irritation if a stenographer is not immediately available. Reasonable charges for the services provided will be made on the basis of prevailing rates for stenographic work. This is the first time that a modern business office has been installed on a British railway train.

Signalling Alterations at Stafford.—Many changes in the signalling at Stafford, L.M.S., were completed on Sunday, February 4, by the replacement of No. 4 box by a new one, with a locking frame of 135 levers. On the Crewe side of Stafford station the box at Tillington has been dispensed with and the up lines have advance sections controlled from Great Bridgeford; similarly, the down lines are controlled from Stafford No. 5. On the Birmingham line the boxes at Rickerscote and Cooper's Crossing have been eliminated by advance sections for the down line from Penkridge Goods box and the up line from Stafford No. 1.

Progress of Railway Bills.—The following Railway and kindred Bills which had been read a first time in the House of Commons on January 31 were read a second time in that House on February 5:—London Midland & Scottish Railway, London Passenger Transport Board, and Southern Railway. The London Transport Bill was committed, and the other two measures were referred to the Examiners of Petitions for Private Bills. Seventy-eight petitions have been deposited against the London Transport Bill, seven against the Southern Railway Bill, and one against the L.M.S.R. Bill. The petition by the Folkestone Corporation against the Southern Railway Bill has reference to the proposed deviation line between Folkestone and Dover.

British and Irish Railway Traffic Returns

GREAT BRITAIN	Totals for 5th Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
L.M.S.R. (6,941¾ mls.)	£	£	£	£	£	£
Passenger-train traffic	355,000	338,000	+ 17,000	1,765,000	1,716,000	+ 49,000
Merchandise, &c.	443,000	386,000	+ 57,000	2,127,000	1,839,000	+ 288,000
Coal and coke	270,000	297,000	− 27,000	1,354,000	1,343,000	+ 11,000
Goods-train traffic	713,000	683,000	+ 30,000	3,481,000	3,182,000	+ 299,000
Total receipts	1,068,000	1,021,000	+ 47,000	5,246,000	4,898,000	+ 348,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic	235,000	229,000	+ 6,000	1,162,000	1,151,000	+ 11,000
Merchandise, &c.	317,000	266,000	+ 51,000	1,545,000	1,282,000	+ 263,000
Coal and coke	244,000	240,000	+ 4,000	1,234,000	1,157,000	+ 77,000
Goods-train traffic	561,000	506,000	+ 55,000	2,779,000	2,439,000	+ 340,000
Total receipts	796,000	735,000	+ 61,000	3,941,000	3,590,000	+ 351,000
G.W.R. (3,750 mls.)						
Passenger-train traffic	145,000	144,000	+ 1,000	760,000	760,000	—
Merchandise, &c.	176,000	148,000	+ 28,000	848,000	732,000	+ 116,000
Coal and coke	112,000	115,000	− 3,000	559,000	559,000	—
Goods-train traffic	288,000	263,000	+ 25,000	1,407,000	1,291,000	+ 116,000
Total receipts	433,000	407,000	+ 26,000	2,167,000	2,051,000	+ 116,000
S.R. (2,181 mls.)						
Passenger-train traffic	223,000	217,000	+ 6,000	1,147,000	1,119,000	+ 28,000
Merchandise, &c.	63,000	53,000	+ 10,000	284,000	258,500	+ 25,500
Coal and coke	42,000	41,000	+ 1,000	184,000	178,500	+ 5,500
Goods-train traffic	105,000	94,000	+ 11,000	468,000	437,000	+ 31,000
Total receipts	328,000	311,000	+ 17,000	1,615,000	1,556,000	+ 59,000
Liverpool Overhead (6¼ mls.)	1,060	1,005	+ 55	5,558	5,223	+ 335
Mersey (4½ mls.)	4,281	3,830	+ 451	21,743	20,274	+ 1,469
*London Passenger Transport Board	496,200	—	—	15,380,400	—	—
IRELAND						
Belfast & Co. Dn. pass. (80 mls.)	1,591	1,526	+ 65	9,138	9,124	+ 14
" " goods	592	584	+ 8	2,519	2,399	+ 120
" " total	2,183	2,110	+ 73	11,657	11,523	+ 134
Great Northern pass. (562 mls.)	7,200	3,800	+ 3,400	35,650	35,150	+ 500
" " goods	9,450	4,450	+ 5,000	37,850	38,000	− 150
" " total	16 650	8,250	+ 8,400	73,500	73,150	+ 350
Great Southern pass. (2,158 mls.)	17,999	17,582	+ 417	88,912	88,232	+ 680
" " goods	32,611	26,690	+ 5,921	150,565	139,631	+ 10,934
" " total	50,610	44,272	+ 6,338	239,477	227,863	+ 11,614

* 31st Week.

British and Irish Railway Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices Feb. 7 1934	Prices Rise/Fall
G.W.R.				
Cons. Ord.	55½	31	56	−½
5% Con. Prefce.	109¾	69½	112	−1
5% Red.Pref.(1950)	109¼	87½	112½	--
4% Deb.	108 15/16	99¼	107	—
4½% Deb.	108	100¾	110½	—
4½% Deb.	116	106	117½	—
5% Deb.	128	117¼	128½	—
2½% Deb.	65	60	64½	—
5% Rt. Charge	124	111½	124½	—
5% Cons. Guar.	122	103	124½	—
L.M.S.R.				
Ord.	29⅞	12⅛	26	−½
4% Prefce. (1923)	51	17	51½	−½
4% Prefce.	72	33¼	76	—
5% Red. Prf. (1955)	93	47¼	96½	—
4% Deb.	103¼	89½	102½	—
5% Red.Deb.(1952)	114	105	113½	+1
4% Guar.	97¼	68⅝	98	−1
L.N.E.R.				
5% Pref. Ord.	22½	7¾	19	−1
Def. Ord.	10¾	4⅛	9⅝	−⅛
4% First Prefce.	65½	19⅝	64	−1
4% Second Prefc.	40½	12¼	38	−½
5% Red.Pref.(1955)	83¾	27	82½	—
4% First Guar.	94¾	58¼	94½*	−1½
4% Second Guar.	89¼	48	89*	−1
3% Deb.	77	60¼	76	—
4% Deb.	102¾	80	101	—
5% Red.Deb.(1947)	112	102½	111	—
4½% Sinking Fund Red. Deb.	107½	98¾	106½	—
SOUTHERN				
Pref. Ord.	71	27¾	69	—
Def. Ord.	24⅜	9⅝	19½	−½
5% Prefce.	107 11/16	74	109	—
5% Red.Pref.(1964)	107¾	78⅞	112½	—
5% Guar. Prefce.	124¼	102¾	122½	—
5% Red.Guar.Pref. (1957)	115⅝	103½	115½	—
4% Deb.	107½	96¾	106	—
5% Deb.	126½	114¼	127½	—
4% Red. Deb. 1962–67	107¼	100	106½	—
BELFAST & C.D.				
Ord.	6	4	6	—
FORTH BRIDGE				
4% Deb.	99½	95½	99½	—
4% Guar.	98½	94	99½	—
G. NORTHERN (IRELAND)				
Ord.	7½	3½	5	—
G. SOUTHERN (IRELAND)				
Ord.	28	16	24¾	—
Prefce.	24	12⅛	19½	+½
Guar.	42	16¾	40	—
Deb.	60	30⅞	60⅝	+⅝
L.P.T.B.				
4½% "A"	117⅞	112	116	—
5% "A"	127¼	119¼	126	—
4½% "T.F.A."	111¼	106	109½	—
5% "B"	122½	114	120	−½
"C"	86¾	74½	84	—
MERSEY				
Ord.	16¼	5	13	—
4% Perp. Deb.	83	63⅞	85½	—
3% Perp. Deb.	62	51	63½	—
3% Perp. Prefce.	50⅝	27	49½	—

* ex dividend.

CONTRACTS AND TENDERS

The L.N.E.R. is in the market for ten K3 standard three-cylinder 2-6-0-type tender locomotives.

The English Steel Corporation has received an order for 500 laminated bearing springs for locomotives from the Great Western of Brazil Railway.

Hawthorn Leslie & Co. Ltd. has secured an order from the Entre Rios Railway for two locomotive boilers, together with spare inner fireboxes and firebox back plates.

Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd. has secured an order from the Buenos Ayres Great Southern Railway for four locomotive boilers for classes 12E and 11C locomotives.

The Buenos Ayres Great Southern Railway has recently placed orders for eight locomotive boilers with Robert Stephenson & Co. Ltd., and for four with Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd.

W. & T. Avery Limited has secured an order from the Egyptian State Railways Administration for two weighbridges. Duchesne & Co., Lyon, has also received an order for one weighbridge from the same administration.

Robert Stephenson & Co. Ltd. has secured an order from the Buenos Ayres Great Southern Railway for four locomotive boilers as follow:—One for 4-8-2 + 2-8-4 class 14 Garratt articulated simple goods locomotive and one each for class 7D, 8C and 8D locomotives.

Tenders for the supply of diesel railcars to the Dahomey railways will be considered shortly at the Ministère des Colonies, 27, rue Oudinot, Paris. They must be handed in by February 22, 1934, to the Ingénieur en Chef de l'Agence Générale des Colonies. Specifications may be seen at the Ministère des Colonies, pièce 4, Pavillon.

Regarding the call for tenders by the South African Railways and Harbours Administration for 50 Class 19C 4-8-2 steam locomotives and tenders announced in the issue of THE RAILWAY GAZETTE for January 26 and further referred to in the issue for February 2, the specification has now reached this country, and the principal dimensions and other leading particulars of the engines are given on page 225. Tenders are due on March 12.

The Chinese Government Purchasing Commission has placed orders for machine tools with the following firms: John Holroyd & Co. Ltd., Muir Machine Tools Limited, John Pickles & Son (Engineers) Ltd., Thos. Robinson & Son Ltd., Alley & MacLellan Limited, Kitchen & Wade Limited, Alldays & Onions Limited, Craig & Donald Limited, Fielding & Platt Limited, Charles Wickstead & Co. (1920) Ltd., Churchill Machine Tool Co. Ltd., Charles Winn & Co. Ltd., Cunliffe & Croom Limited, F. Town & Sons, Oldfield & Schofield Co. Ltd., D. Mitchell & Co. Ltd., and Summerskill Bros.

The Keighley Electrical Engineering Co. Ltd. has received an order from the L.N.E.R. for six 30-cwt. capacity goods lifts for Parkeston Quay.

Cravens Railway Carriage & Wagon Co. Ltd. has received an order from Arcos Limited for one 200-ton bogie well wagon mounted on four six-wheeled bogies for the U.S.S.R. railways.

Bayliss, Jones & Bayliss Limited has received an order for 12,000 steel fishbolts and nuts from the Entre Rios Railway.

Alfred Herbert Limited has received orders from the Entre Rios Railway for one No. 17 patent universal cutter and tool-grinding machine, one No. 7 turret lathe, and one Lumsden vertical-spindle reciprocating table surface grinder.

Guest, Keen & Nettlefolds Limited has received an order for 6,700 clip bolts for tie plates and 41,700 rolled steel rail clips from the Buenos Ayres Western Railway.

P. & W. MacLellan Limited, on behalf of S.A. Des Usines et Boulonneries de Mariemont, has received an order for 300,000 mild steel dogspikes for the Buenos Ayres Western Railway.

The Egyptian State Railways Administration invites tenders, receivable by the General Management, Cairo Station, by March 14, for the supply of 450 carriage and wagon tyres.

The Egyptian State Railways Administration invites tenders, receivable at the General Management, Cairo Station, by April 18, for the removal of the old swing span of the Hagar-el-Nawaitia bridge over the Mahmoudia Canal, Cairo–Alexandria line, and the supply and laying of about 115 tons of rolled steel, about 10 tons of cast steel, and about 140 cm. of timber for stockades, including 100 piles.

Tenders receivable by March 12 by the Agent, North Western Railway of India, Lahore, are invited for the supply of one saturated steam locomotive boiler for G class 2-8-2 type 2 ft. 6 in. gauge locomotive. Drawings are being placed on view at Hodges, Bennett & Co. Ltd., 16, Victoria Street, Westminster, S.W.1. Tenders are also invited by the same administration, and are receivable by March 1, for the supply of piston valve rings.

The Birmingham Railway Carriage & Wagon Co. Ltd. has received orders from the Morvi Railway, India, for four bogie steel timber trucks, 30 four-wheeled steel open goods wagons, 10 four-wheeled steel covered goods wagons and 10 four-wheeled steel underframes. These orders are to the inspection of Messrs. Robert White & Partners. Surahamnar Brukes, Sweden, has received the order for the supply of wheels and axles required for the above-mentioned rolling stock, and the A.B.C. Coupler & Engineering Co. Ltd., Westminster, S.W.1, the order for the supply of drawgear.

The Vulcan Foundry Limited has received an order from the South Indian Railway for three class XD locomotives. The announcement of the invitation to tender for these was published in our issue of January 5. The locomotives are to be built to the inspection of Messrs. Robert White & Partners.

The Assam-Bengal Railway has placed the orders for locomotive boilers with W. G. Bagnall Limited for five boilers for F class 0-6-0 saturated steam locomotives, and with Nasmyth Wilson & Co. Ltd. for five boilers for H4 class 4-6-0 superheated locomotives, and one boiler for K3 class 4-8-0 superheated locomotive.

Cowans Sheldon Limited has received an order from the Government of Mysore for a 47-ft. span overhead electric travelling crane complete.

Beruck & Comens (Engineers) Limited has received an order from the East Indian Railway for a covered C.I. overhead tank of 53,870 gall. capacity and with 48 ft. 6 in. of steel staying.

Hurst Nelson & Co. Ltd., Motherwell, has received an order from the Government of Mysore for four rolled-steel metre-gauge bogie carriage underframes complete with wheels and axles.

Turner Hoare & Co. Ltd., Bombay, has received from the Indian Stores Department an order for a 2-ton Grafton crane for 20-ft. fixed radius, metre gauge, and for a Priestman grab.

The Birmingham Railway Carriage & Wagon Co. Ltd. has secured an order for 31 metre-gauge MA3-type four-wheeled covered goods wagons, complete with wheels and axles, for the Junagad State Railways, to the inspection of Messrs. Robert White & Partners.

Tenders are invited by the Bengal-Nagpur Railway for seven boilers for F.T.S.-class tank locomotives. Tenders are receivable by February 21 and specifications and forms of tender are obtainable at the offices of the company at 132, Gresham House, Old Broad Street, London, E.C.2.

The Indian State Railways Administration has placed orders for wagons with Jessop & Co. for 760 broad-gauge covered wagons, and with Braithwaite & Co. (Engineers) Ltd. for 300 broad-gauge open wagons. It is understood that Burn & Co. has also secured a substantial order.

Tenders receivable to March 1 by the Bridge Engineer, Madras & Southern Mahratta Railway, Park Town, Madras, are invited for the fabrication and supply of about 220 tons of structural steelwork, complete with details and about 8,400 sq. ft. of patent glazing for an engine shed at Hubli.

OFFICIAL NOTICES

London Midland & Scottish Railway Company.

NOTICE is hereby given that the Ordinary General Meeting of the London Midland & Scottish Railway Company will be held at Friends House, Euston Road, London, N.W., on Friday, the 23rd February, 1934, at 11.30 a.m. precisely, for the transaction of the general business of the Company.

JOSIAH CHARLES STAMP,
Chairman.
OWEN GLYNNE ROBERTS,
Secretary.

Euston Station,
London, N.W.1.
6th February, 1934.

The Chinese Government Purchasing Commission.

THE Commission is prepared to receive Tenders from British manufacturers for the supply of :—

(A) 7,325 Metric Tons of 43-kg. RAILS,
524 Metric Tons of FISHPLATES.
(B) 48 Metric Tons FISHBOLTS,
353 Metric Tons SCREWSPIKES,
80,000 SPRING WASHERS.
(C) 42,000 RAIL ANTI-CREEPERS.

Tender Forms, Specifications and Drawings can be obtained on and after February 14th at the Offices of the Consulting Engineers, Messrs. Sandberg, 40, Grosvenor Gardens, London, S.W.1.

Non-returnable fees will be charged for each set of documents : (A) £1 10s.; (B) 15s.; (C) 10s.

South Indian Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of :—

1.—COPPER INGOTS (52½ TONS).
2.—LAMINATED SPRINGS.

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders addressed to the Chairman and Directors of the South Indian Railway Co. Ltd. marked :—"Tender for Copper Ingots," or as the case may be, with the name of the firm tendering, must be left with the undersigned not later than 10 a.m. on Friday, February 16, 1934, in respect of Specification No. 1 and not later than 12 noon on Friday, February 23, 1934, in respect of Specification No. 2.

The Directors do not bind themselves to accept the lowest or any tender.

A charge, which will not be returned, will be made of 10s. for each copy of Specification No. 1 and of 5s. for each copy of Specification No. 2.

Copies of the drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, Westminster, S.W.1.

A. MUIRHEAD,
Managing Director.

91, Petty France,
Westminster, S.W.1.
February 7, 1934.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to :—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive tenders for :—

SEVEN BOILERS FOR F.T.S. CLASS TANK ENGINES.

Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after Wednesday, February 7, 1934.

A fee of 20s. will be charged for each copy of the specification, which is *not* returnable.

Tenders must be submitted not later than NOON on Wednesday, February 21, 1934.

The Directors do not bind themselves to accept the lowest or any tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
R. GRANT,
Secretary.

Universal Directory of Railway Officials and Railway Year Book

39th Annual Edition, 1933-34.

Price 20/- net.

This unique publication gives the names of all the principal railway officers throughout the world, together with essential particulars of the systems with which they are connected. Much general and statistical information about railways is also concisely presented.

THE DIRECTORY PUBLISHING CO. LTD., 33, Tothill Street, London, S.W.1.

QUESTIONS IN PARLIAMENT

Steel Carriages

Major Thomas, on February 7, asked the Minister of Transport what steps had been taken by the railway companies to substitute steel passenger coaches for wooden coaches.

Mr. Stanley.—I am informed that during 1933 the four main line companies constructed 936 passenger carrying vehicles and that steel was used in the construction of these vehicles up to 75 per cent. of the total weight.

Level Crossings

Mr. Spencer asked the Minister of Transport what steps his department was taking to assist in the removal of railway level crossings which were a cause of danger or delay to road traffic.

Mr. Stanley.—Well-considered schemes for the elimination of level crossings are eligible for grant from the Road Fund, and I am always ready to receive applications from the responsible highway authorities for projects of this character.

Strengthening of Bridges

Mr. Louis Smith asked the Minister of Transport if he could state what steps it was proposed to take during the current year with regard to the replacing of the remaining dangerous and inadequate bridges in Great Britain.

Mr. Stanley.—In connection with the provisions of section 30 of the Road and Rail Traffic Act, 1933, highway authorities are furnishing me with lists of the weak bridges in their areas in order of priority from the point of view of the need for strengthening or reconstructing. Highway authorities generally have been frequently informed of the readiness of my Department to make grants at the rate of 75 per cent. towards the cost of approved schemes for strengthening or reconstructing weak bridges in the ownership of railway and canal and similar undertakings.

Mr. Everard (C. Melton) also asked the Under-Secretary of State for Air whether facilities could be given to Members of Parliament who fly to London, instead or using the railway vouchers, to use, free of charge, the most convenient Government aerodrome.

Sir Philip Sassoon replied that it was not considered practicable to adopt that suggestion.

TURN OF THE TIDE IN TANGANYIKA?—For the first time in 1933, the approximate revenue earnings of the Tanganyika Railways and Steamer Services for September exceeded those of the corresponding month in 1932. The figures for that month and for the first nine months of 1932 and 1933 were as follow :—

Year	Total for September	Total January to September	Estimated Figure	Under the Estimate
	£	£	£	£
1932	39,236	325,414	—	—
1933	45,745	327,305	337,500	10,195
Increase	6,509	1,891	—	—

ROAD VEHICLES IN GREAT BRITAIN.—A return has been issued by the Ministry of Transport showing gross receipts from licences, and the number of licences issued and surrendered during the 12 months ended November 30, 1933. The gross amount was £29,201,133 compared with 28,431,766 in the previous year. The total number of vehicles, excluding tramcars and trade licences, was approximately 2,013,800, compared with 1,926,000 in the previous year. The total of motor vehicles registered for the first time in November, 1933, was 23,815, compared with 20,146 in November, 1932. The 1933 figures for last November included 280 hackney and 5,067 goods vehicles as compared with 152 hackneys and 3,529 goods vehicles in November, 1932. Copies of the return can be obtained from H.M. Stationery Office, Adastral House, Kingsway, W.C.2, price 2s. 6d.

G.W.R. AND WEST COUNTRY FLOWERS.—Some of the flowers that bloom in the spring—and even earlier—in the Scilly Isles and Cornwall are on view just now, in glorious profusion, at the G.W.R. office windows in Trafalgar Square and Oxford Street, and, very naturally, are attracting a good deal of attention. At the same time, the principal stations and offices on the company's system are carrying a fine poster display relating to our West country's wonderful floral output. "See the flower harvest of Cornwall and the Scilly Isles" is the railway's "note"—a hint that will doubtless be fully acted upon.

Railway Share Market

In the stock and share markets the dividend statement of the London Midland & Scottish Railway on Wednesday made a good impression and there was an immediate rise in the various issues of the company. The increase in the dividend on the first preference stock to 3½ per cent., which compares with 3 per cent. for 1932, created satisfaction although recent appreciation in the price of the stock has been based mainly on prospect of the full dividend of 4 per cent. being earned for the current year. At the present price, allowing for the deduction in due course of the final dividend for 1933, this would mean a yield of around 5¼ per cent. The 1923 preference stock, which ranks after the first preference and the redeemable preference stocks, also moved up in price on estimates that dividend prospects for 1934 have been improved.

Changes in other directions were not important and the market is not anticipating any further movement until the announcements of the other companies are made, that of the Southern Railway being due on Monday and that of the Great Western on Wednesday. The L.N.E. statement will not be issued until next Friday. In the foreign railway market there was a fractional reaction from the higher level established in the past fortnightly Stock Exchange account by the Argentine railway ordinary stocks. The slight improvement in the exchange has created a more hopeful outlook but current market estimates of dividends are still on the pessimistic side. Both the Buenos Ayres Great Southern and the B.A. Western are expected to be able to show a partial earning of their preference dividends but the Central Argentine is not apparently expected to do more than earn the full debenture and note interest whilst the Buenos Ayres and Pacific is not expected to be in a position to make any return on any class of its debt or capital. One of the features in the market has been the strong buying of Nitrate Railways shares, both the bearer and registered class and the preferred and deferred ordinary shares advancing in price. The activity was maintained notwithstanding the disturbance to business in Paris where the Bourse is particularly interested in the shares of this company. At this time last year there was similar activity in this company's shares in anticipation of the report which, however, caused disappointment. The new report is due in about three months' time.

International of Central America preferred shares were marked up 1½ dollars to $10-$15 but no business was recorded, the last bargain having been at $12½ on the 2nd inst. Similarly, Midland of Uruguay 5 per cent. prior lien debenture stock rose two points to 39-43 but the last transaction was on January 17 when business was done at 34. Canadian Pacific shares have again been buoyant on the rise in New York and the improvement in the traffic statement for the past month.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1933–34	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1933	No. of Week	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1933	Prices: Lowest 1933	Prices: Feb. 7, 1934	Prices: Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	830	4.2.34	13,550	+ 4,490	5	60,380	44,750	+ 15,630	Ord. Stk.	26	11¾	22	Nil
	Argentine North Eastern	753	3.2.34	10,700	+ 2,400	31	315,900	349,500	− 33,600	,,	14½	5	9½	Nil
	Argentine Transandine	111	13.1.34	1,540	+ 130	28	30,950	5,640	+ 25,310	A. Deb.	55	40	50	8
	Bolivar	170	Dec., 1933	5,350	− 1,250	52	72,700	89,350	− 16,650	6 p.c. Db.	10	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	15	11	12½	4
	Buenos Ayres & Pacific	2,806	27.1.34	135,000	+ 3,000	30	2,902,000	3,066,000	− 164,000	Ord. Stk.	26	9⁷⁄₁₆	14½	Nil
	Buenos Ayres Central	190	21.1.34	10,127	+ 1,615	30	301,476	277,481	+ 23,995	Mt. Db.	30	10	27½	Nil
	Buenos Ayres Gt. Southern	5,075	27.1.34	260,000	− 15,000	30	5,611,000	5,540,000	+ 71,000	Ord. Stk.	44½	21½	32½	Nil
	Buenos Ayres Western	1,926	3.2.34	76,000	− 4,000	31	1,937,000	2,035,000	− 98,000	,,	34½	15¾	25½	Nil
	Central Argentine	3,700	27.1.34	‡216,000	+ 36,000	30	4,847,000	5,591,000	− 744,000	,,	28½	15	21½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	18	10	13½	Nil
	Cent. Uruguay of M. Video	273	3.2.34	16,034	+ 683	31	505,074	478,104	+ 26,970	Ord. Stk.	20	8	15	Nil
	Do. Eastern Extn.	311	3.2.34	3,698	+ 614	31	98,605	100,958	− 2,353	—	—	—	—	—
	Do. Northern Extn.	185	3.2.34	1,772	− 190	31	53,699	59,135	− 5,436	—	—	—	—	—
	Do. Western Extn.	211	3.2.34	2,374	+ 1,113	31	48,965	43,843	+ 5,122	—	—	—	—	—
	Cordoba Central	1,218	3.2.34	36,000	+ 3,000	31	1,329,000	1,332,000	− 3,000	Ord. Inc.	9¼	2½	6	Nil
	Costa Rica	188	Nov., 1933	18 534	− 3,195	21	99,724	107,788	− 8,064	Stk.	29	20	25	8
	Dorada	70	Dec., 1933	11,000	+ 2,600	52	96,800	83,600	+ 13,200	1 Mt. Db.	76½	68¾	80	7½
	Entre Rios	810	3.2.34	16,900	+ 4,200	31	494,400	496,100	− 1,700	Ord. Stk.	26½	9	19½	Nil
	Great Western of Brazil	1,082	3.2.34	11.700	− 5,600	5	57,400	87,100	− 29,700	Ord. Sh.	23/6	1/2	5/4	Nil
	International of Cl. Amer.	794	Year, 1933	—	—	52	$4,537,681	$5,013,065	− $475,384	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	1/2	1/16	1/2	Nil
	La Guaira & Caracas	22¾	Jan., 1934	4.400	− 2,710	4	4,400	7,110	− 2,710	Stk.	16	10	12½	Nil
	Leopoldina	1,918	27.1.34	22.273	− 3,191	4	75,435	94,185	− 18,750	Ord. Stk.	20¼	10	12	Nil
	Mexican	483	31.1.34	$291,300	+ $45,400	4	$861,400	$739,900	+ $121,500	,,	3	1/2	2½	Nil
	Midland of Uruguay	319	Dec., 1933	11.542	+ 2,105	26	57,230	52,204	+ 5,026	Ord. Stk.	2	1	2	Nil
	Nitrate	411	31.1.34	17.694	+ 14,586	4	33.649	5,488	+ 28,161	Ord. Sh.	78/6	11/16	3/2	Nil
	Paraguay Central	274	20.1.34	3 280	+ 760	29	95,000	81.400	+ 13.600	Pr. Li. Stk.	72	49½	67	8¹⁵⁄₁₆
	Peruvian Corporation	1,059	Jan., 1934	58,729	+ 8,381	30	388,420	396,121	− 7,701	Pref.	15¼	5	12½	Nil
	Salvador	100	20.1.34	1.759	− 3,069	30	29,493	61,992	− 32,499	Pr. Li. Db.	70	66½	70	7⅛
	San Paulo	153½	21.1.34	29,385	− 15,037	3	85,973	91.139	− 5,166	Ord. Stk.	102	68	79	2½
	Taltal	164	Dec., 1933	8 915	+ 7,855	26	31,065	8,115	+ 22,950	Ord. Sh.	1¾	¾	1⅝	6¹⁵⁄₁₆
	United of Havana	1,365	4.2.34	15.750	− 311	31	410,148	444,009	− 33.861	Ord. Stk.	8	2	6	Nil
	Uruguay Northern	73	Dec., 1933	1,298	− 706	26	7,383	9,915	− 2,532	Deb. Stk.	6	3½	5	Nil
Canada	Canadian National	23,750	31.1.34	776,454	+ 120,640	4	2,312,515	1,944,718	+ 367,797	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—4 p.c.	Perp. Dbs.	60½	38	62	6⁷⁄₁₆
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	99¾	85	100½	4
	Canadian Pacific	17,024	31.1.34	620,400	+ 99,400	4	1,794,000	1,535,200	+ 258.800	Ord. Stk.	22⅛	11	18	Nil
India†	Assam Bengal	1,329	6.1.34	23,820	+ 660	40	938,278	963,505	− 25,227	Ord. Stk.	79	70	73½	4¹⁄₁₆
	Barsi Light	202	13.1.34	2 625	− 562	41	119,212	108,667	+ 10,545	Ord. Sh.	101¾	70	98½	6¹⁄₁₆
	Bengal & North Western	2,113	13.1.34	51.412	+ 1,360	15	710,520	670.377	+ 40.143	Ord. Stk.	292	240	276	5¹³⁄₁₆
	Bengal Dooars & Extension	161	13.1.34	2,970	+ 607	41	123,251	123,984	− 733	,,	127	119	125	5⅛
	Bengal-Nagpur	3,269	6.1.34	115,200	+ 6,950	40	4,183,397	3,859,565	+ 323,832	,,	97¼	83½	97½	4⅛
	Bombay, Baroda & C. India	3,089	20.1.34	164,400	+ 3,900	42	6,150,450	5,998,050	+ 152,400	,,	112	107	110½	5⁷⁄₁₆
	Madras & South'n Mahratta	3,230	13.1.34	107,475	+ 2,185	41	4,412.277	4,235.544	+ 176.733	,,	127	114¼	122½	7¹⁄₁₆
	Rohilkund & Kumaon	572	13.1.34	10,518	+ 130	15	129,734	120,972	+ 8,762	,,	260	225	252	5¹³⁄₁₆
	South India	2,526	6.1.34	73,198	+ 965	40	3,135,352	3,189 450	− 54 098	,,	119½	112	116½	6⅞
Various	Beira-Umtali	204	Nov., 1933	49.677	+ 11,566	8	99,606	80.652	+ 18,954	—	—	—	—	—
	Bilbao River & Cantabrian	15	Dec., 1933	988	+ 48	52	18,980	21,553	− 2,573	—	—	—	—	—
	Egyptian Delta	621	20.1.34	6.872	− 126	42	191.068	212,476	− 21,408	Prf. Sh.	131/32	13/4	2	Nil
	Great Southern of Spain	104	27.1.34	2.194	− 20	4	9,516	8,776	+ 740	Inc. Deb.	4	3	5½	Nil
	Kenya & Uganda	1,625	Aug., 1933	159,746	+ 12,456	35	1,523,550	1,273,216	+ 250,334	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	53	33½	38½	9¼⅛
	Mashonaland	913	Nov., 1933	91,764	+ 30,921	8	186,337	122,843	+ 63,494	1 Mg. Db.	91¾	42	94	5⁵⁄₁₆
	Midland of W. Australia	277	31.12.33	15 285	− 870	25	80.396	77,686	+ 2,710	Inc. Deb.	89	70	95½	4⅝
	Nigerian	1,903	30.12.33	59.505	+ 2,698	40	1,205,229	1,300.165	− 94,936	—	—	—	—	—
	Rhodesia	1,558	Nov., 1933	156,230	+ 50.618	8	316,792	213,960	+ 102,832	4 p.c. Db.	98½	80¾	99½	4
	South African	13,151	13.1.34	470,977	+ 44,587	42	18.599,352	16,061,439	+2.537,913	—	—	—	—	—
	Victorian	6,172	Oct., 1933	762 659	− 44,068	17	2,797,539	2,885 003	− 87.464	—	—	—	—	—
	Zafra & Huelva	112	Nov., 1933	10,926	+ 149	47	123,826	120,955	+ 2,871	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. ‡ Average rate of exchange for the week :—This year 33⁵³⁄₆₄. Last year 41⁴⁵⁄₆₄.